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Food habits and preferences: A study of Iowa people of two age groups

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FOOD HABITS AND PREFERENCES

A Study of Iowa People of Two Age Groups

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**Quartermaster Food and Container
Institute for the Armed Forces
cooperating**

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SUMMARY

A study was made of the food habits and preferences of two groups of Iowa people, the 17- to 19- and the 46- to 58-year-old men and women. The information, obtained through personal interviews, consisted of daily menus and answers to a questionnaire designed to determine the degree of preference for food items and groups.

Food preferences and practices were found to be closely related. Preferred menus, *i.e.*, menus given as those desired if there were no restrictions of any kind, did not differ markedly from the actual. In general the backbone of the diet was meat, bread, potatoes, dessert and beverage other than milk, and this is the plan which people prefer.

Differences in attitudes toward food were noted with age, sex, place of residence and probably with nationality origin. Milk was preferred and used by many more of the younger than of the older people. Eggs were more highly favored by older people. Women favored vegetables and fruits and used them more frequently than men. Food dislikes were more prominent among older men and younger women. Zest for food seemed greater for people of the open country than elsewhere; meals were also heavier. Attitudes toward foods varied somewhat with nationality origin. Scandinavians, in particular, differed from other groups in their preferences for many food items, and, furthermore, showed signs of adhering to customs and habits of their ancestors.

Health and variety were not attributes ascribed to the foods for which people had a high degree of preference; in fact these characteristics were more frequently linked with the less popular foods. Older people more than the younger people thought of the health aspects of food; younger people more frequently mentioned flavor as a reason for liking a food. The qualities most frequently mentioned in connection with well-liked foods referred to flavor ("tastes good") and satiety value (expressed as "satisfying and filling"). Odor was mentioned as an unfavorable quality of food but seldom as a favorable one. Color and texture were infrequently mentioned as reasons for preference.

One of the most outstanding implications for future research is revealed by the fact that people were generally unable to account for their attitudes toward food, or to report them in fine gradations. Three levels of interest mainly were noted—very good, good and dislike.

These two groups of Iowans followed the pattern of three meals a day. Their meals were usually eaten at home and with groups of two or three persons. The meal most frequently eaten away from home was the noon meal; but of the

noon meals only an estimated 10 percent were eaten in public eating places. The substances most often appearing on breakfast menus were beverage and breads; on noon and evening menus, meat, bread, dessert, and to a lesser extent, potatoes and a beverage other than milk. There was little difference between noon and evening meals. Urban people tended to have heavier meals in the evening than at noon. The types of meals eaten by the overweight and underweight subjects did not differ appreciably from those of the normal weight subjects. Both groups seemed slightly to restrict their food intake as compared with the normal weight group. The overweight tended to restrict milk as well as other foods.

Meat as a class of food was very popular; 96 percent of these Iowans had meat in their daily menus. More people, however, would like meat all meals than have it. Chicken was probably the best-liked meat by the two age-groups of Iowans, with certain cuts of beef next, and pork liked least of the three. Lamb was rated as well-liked by less than 10 percent but was actually disliked by about one-half. Organ meats were highly unpopular, and fish well-liked by only about one-third of the respondents. Turkey was less well-liked than chicken particularly in some nationality groups. Cut of meat made a difference in preference. Beef steak was more popular than roast, and stew less popular than ground beef.

Eggs were more highly favored than milk but less well-liked than meat. In contrast with milk, eggs appealed more to older than to younger people. They were used as such more frequently at breakfast than in other meals. More people would like them at breakfast than have them. They were more likely to appear at the evening meals of people in the open country than of urban places. As the size of the group eating together increased, the use of eggs in the evening meal tended to decrease. The use of legumes as a substitute for meat and eggs was apparently accompanied by a loss in appetite appeal.

Green and yellow vegetables as a class were well represented on only 43 percent of the daily menus. Half of the people considered them very good and only 2 percent disliked the group as a whole. Attitudes varied widely with the different vegetables in this class. Mild favored ones seemed more acceptable than strong flavored ones, such as peppers, turnip greens and broccoli. These vegetables were usually an accompaniment of the main meal of the day. Sixty-one percent of these Iowans had three servings a day of other vegetables and fruits. Irish potatoes were prom-

inent among these. Of all the vegetables, sweet corn and Irish potatoes were best liked by most people. Irish or white potatoes were much more popular than sweet potatoes.

The food group consisting of citrus fruits, tomatoes, melons and raw cabbage was included to the extent of one serving a day in the meals of 53 percent of these Iowans. More than half of the people consider these foods very good, and salads, which appeared in only about 25 percent of actual noon and evening meals, were listed more frequently in the preferred than in the actual meals. Fruits and vegetables were regarded as a health-giving group of foods and were liked because of their flavor. With fruits in general, however, the nonacid and dried were less popular than others.

Among these Iowans there was no outstanding preference for cereals other than wheat bread which appeared at most meals. Corn cereals were not highly popular. Corn bread seldom appeared on the menus. Despite its frequency of use, bread was not recognized as a food for which the people had a high appetite level. Apparently it is a food whose appeal rests in the fact that it is "satisfying and filling."

About three-fourths of the noon and evening meals contained desserts. Ice cream was the favorite dessert, except among the Scandinavians who rated cookies the highest. Younger people were more enthusiastic about desserts than older people. Puddings, the least popular dessert, were acceptable to more older people than younger people.

Only 28 percent of the people drank 2 cups or more of milk per day. Use of milk in prepared foods was also very limited. As a beverage it was used least often at breakfast and with about equal frequency at noon and evening meals. The most conspicuous difference observed in this study was between the two age groups in their use of milk; 58 percent of the younger but only 20 percent of the older subjects had the commonly accepted standard of 2 cups a day. The preference for milk was not great; in fact, if people represented in this study could have just what they wanted, few would have more milk. Few people, however, actually disliked it. The chief characteristic mentioned by the respondents was that it is a healthful food.

In contrast to milk, butter is one of the most highly favored foods. The appetite level for margarine was considerably lower than that for butter. Cheese was rated lower than milk in appetite appeal, and was used by no more than 10 percent of the people at the noon or evening meals.

The use of these groups of foods varied considerably with the farming section of the state. In the Southern Pasture area, which rates lower than the other two areas economically but higher educationally, more people used milk and the green and yellow vegetables in amounts recommended. The general nutritive level of the diets of the people of this area seemed higher than that of the people of other areas. The Northeastern Dairy area ranked next to lowest in use of milk. Diets of this area and of the Western Livestock area were most questionable from the nutritional standpoint.

Income had an apparent effect on use of the different food groups. The frequency of use of fruits and vegetables, other than the green and yellow, tended to increase with income. The latter, however, were notably unaffected by this factor. At all income levels most of the people had meat, although the proportion having meat tended to increase slightly with income level. The use of milk increased with the intermediate levels but was equally poor in the highest and lowest levels. There was some evidence that good diets were more frequent in the middle income levels than in the highest and lowest levels.

While the daily dietary records obtained in this study were not calculated for their adequacy in the various nutrients, the use of food is such as to indicate probable deficiencies in calcium and vitamin C, and perhaps in vitamin A and riboflavin.

The observations of this study suggest that the diets of the younger people are better than those of the older people; those of men may be better than those of women; those of people in the open country better than those of the residents elsewhere. The food habits of Iowans as represented in this study need improvement particularly in the use of milk, the green and yellow vegetables, and in the group of foods consisting of citrus fruits, tomatoes, raw cabbage and melons.

Food Habits and Preferences

A Study of Iowa People of Two Age Groups

BY ERCEL S. EPPRIGHT

A better understanding of the food consumption habits of people and of their attitudes toward food is important to progress in nutrition education, and to efficiency and economy in meal planning. The full impact of nutrition on the health and well-being of people will not be felt until the forces which dominate food choices are more thoroughly understood.

This study was undertaken in 1946-47 in cooperation with the Research Division of the Quartermaster Food and Container Institute. It was part of a larger study designed to obtain information regarding the appetite level for various foods of people of two age groups, 17-19 years and 46-58 years, in different parts of the United States.

The purposes of the study as carried out in Iowa were as follows:

1. To obtain information concerning the use of food by Iowa families, represented through the two age groups.
2. To study some of the characteristics or conditions which may be related to the food selection of Iowa people.
3. To discover some of the attitudes of the people toward various foods and groups of foods.

The two population groups of the state were sampled according to a plan designed by the Statistical Laboratory of Iowa State College. This plan involved area-probability methods in such a way that every person in the two age-populations had a known chance of being chosen for the sample. Since research in food consumption habits is relatively new, this investigation is as important from the standpoint of methodology as for the actual results obtained. This presentation of the investigation, therefore, has emphasized the sampling procedures, staff and personnel involved, and methods of obtaining information as well as the analysis of results.

Because of Iowa's unique advantages in food production, a study of the food consuming habits of its people should be of considerable interest. Such a study should show what takes place in food consumption where food production is abundant, income is high in proportion to living costs and educational standards are above average.

The groups selected for study were people of both sexes of the ages 17-19 and 46-58. These represent two contrast-

ing groups, economically, physiologically and socially. The former consists of people largely without established homes of their own, whose habits may yet be in the formative stage. The latter, on the other hand, should reflect food habits of probably the most stable group of our population. This age group consists of people whose status is established but who are not, as yet, subject to the irregularities of old age. From the educational standpoint, the former has had the benefit of recent advances in nutrition education in the schools while the latter may have had less systematic information. Comparison between the food habits of two groups of people, differing in age by 30 to 40 years, may also give some idea regarding constancy of food habits throughout the life cycle.

METHODS OF PROCEDURE

SCOPE OF THE STUDY

The data for this study were obtained by interviewing 1,051 persons in Iowa during January-June, 1947. About 90 minutes was required to complete the average interview. All persons in the two specified age groups were eligible for interrogation; no one was excluded because of nationality, economic class or occupation.

In general the data concerned the activities, behavior, attitudes and opinions of the individual in regard to various aspects of food. In addition, information pertaining to the individual *per se*, the household of which he was a member, his dwelling unit, etc.—characteristics which may be associated with or influence a number of aspects of food consumption—was also obtained. (See appendix p. 970 for a copy of the questionnaire used.)

Although these data were obtained from only 1,051 persons, they provide information suitable for estimating the characteristics, behavior and certain attitudes of all persons in Iowa in the two age groups, 17-19 and 46-58. At the time the survey was made the two groups consisted of about 130,000 and 400,000 persons, respectively. Inasmuch as it was the object of the study to examine the characteristics of these age groups over the whole of Iowa, considerable care was taken to obtain a sample which would properly represent the two populations. Consequently special methods of sampling were adopted in order to obtain representativeness within calculable limits of tolerance. This basic method of sampling used is sometimes referred to as area-probability sampling.

OBTAINING THE DATA

The data were obtained on a sampling basis, following a scheme designed for this study. The sample consisted of 1,408 persons of the required ages, located in 18 cities, in 34 towns and villages (populated centers under 2,500 in size), and in 53 small areas which were scattered through 20 counties and represented the open country portion of Iowa. (See fig. 1 for a map of Iowa showing the general layout of the sampling plan.)

By design, the fractions of all qualifying inhabitants selected for the sample varied somewhat from zone to zone. Iowa was divided into the three zones: (1) urban, which includes all areas in incorporated places of more than 2,500 inhabitants; (2) rural place, composed of all areas in non-urban populated places; and (3) open country, the residual area. The sampling fraction in the urban zone was $1/328$; in the rural place zone, $1/172$, and in the open country zone, $1/333.3$. Estimating the characteristics of all Iowans in the two age groups required weighting the sample results by

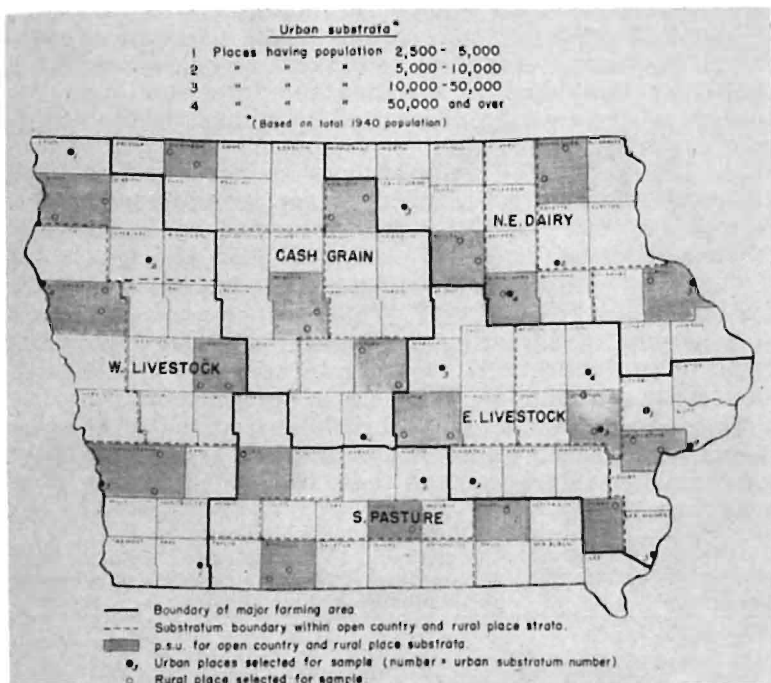


Fig. 1. Sample map for Food Preference Survey.

these sampling fractions. The purpose in using the non-proportional type of sampling, rather than using a constant sampling fraction in all zones, was to obtain a sufficiently large sample number of town and village persons to facilitate comparisons with those in the other two zones.

The interviewers experienced considerable difficulty in finding at home the eligible respondents designated by the sampling scheme, particularly in the urban zone. Even if the sample respondents were available, they often were unwilling or "too busy" to give the desired information. Following is a breakdown of the field returns.

Age group	Total number of eligible respondents	Number from whom interviews were obtained	Percent of completion of interviewing
17-19 years	311	227	73.0
46-58 years	1,097	824	75.1
Total	1,408	1,051	74.6

If we regard a noninterview as a case where a person selected by the sampling scheme was for some reason not interviewed, the total number of noninterviews was 357, or about 25 percent of all possible cases. This rate of non-return is generally found to be higher for surveys where a particular individual is specified for interview than for surveys where any of a number of individuals in the household can serve as the eligible respondent from that household. The reasons for noninterviews included: not-at-home after two or more calls, in college or in military service, refusal or "too busy" to give information, illness and feeble-mindedness.

The total number of questionnaires analyzed was 1,311 (or was derived from 1,311). This number came as a result of a scheme of adjusting for certain noninterviews (*i.e.*, using office duplication) in order to keep the problems of analysis to a minimum. For details, see appendix.

The following table gives a breakdown of the 1,311 questionnaires punched on cards for analysis (including those for completed interviews and those duplicated for, for non-interviews).

Age group	Number of original (interview) questionnaires	Number of duplicate (noninterview) questionnaires	Total number punched on cards
17-19 years	227	64	291
46-58 years	824	196	1,020
Total	1,051	260	1,311

TABLE 1. DISTRIBUTION OF 1311 ELIGIBLE RESPONDENTS IN SAMPLE.

Item	Open country*		Rural places		Urban		State totals	
	No.	Pct.**	No.	Pct.**	No.	Pct.**	No.	Pct.**
Males, 17-19 yrs.....	55	5	36	2	35	3	126	10
Females, 17-19 yrs....	44	4	42	2	79	7	165	13
Males, 46-58 yrs.....	158	14	159	8	189	17	506	39
Females, 46-58 yrs....	123	11	197	9	194	18	514	38
(Subtotal, 17-19 yrs.)	99	9	78	4	114	10	291	23
(Subtotal, 46-58 yrs.)	281	25	356	17	383	35	1020	77
(Subtotal, males).....	213	19	195	10	224	20	632	49
(Subtotal, females)....	167	15	239	11	273	25	679	51
GRAND TOTAL.....	380	34	434	21	497	45	1311	100
Subtotals for major farming area:								
Northeast Dairy.....	65	6	67	3	106	10	238	19
Cash Grain	83	8	92	4	113	10	288	22
Western Livestock...	88	8	96	4	143	13	327	25
Southern Pasture	56	5	63	3	13	1	132	9
Eastern Livestock....	88	8	116	6	122	11	326	25

*The open country refers to isolated homes in sparsely populated rural areas; rural places, to incorporated and unincorporated aggregates of dwelling places containing up to 2,500 inhabitants; and urban places, to those incorporated places having populations greater than 2,500. For more detailed description of the three zones used in the stratification, see appendix.

**Percentages are based on an adjusted sample total for the state which represents a weighting and pooling of actual sample totals for the three zones (open country, rural place and urban). This pooling was necessary since sampling rates varied from zone to zone, being doubled in the rural places. The weights used in pooling sample totals were derived from the sampling rates.

The distribution of the 1,311 respondents according to the various subdivisions of the study is shown in table 1.

In order to attain quality of information, some care was given to the selection and training of interviewers. A training school was held in Ames at which members of the Statistical Laboratory presented instructions on interview technique and on the procedure for carrying out the sampling plan in the field.

ORGANIZATION OF IOWA FOOD HABITS STUDY

Project personnel and their responsibilities were as follows:

Personnel	Responsibilities
1. Project leader, a nutritionist.	Administration of project. Adaptation of questionnaire prepared by The Research Division of the Quarter-master Food and Container Institute for use in Iowa. Development of plan for accessory study in Iowa. Consultation on all phases of the study. Interpretation of data. Compilation of report.

2. Project supervisor, a home economist. Selection and training of interviewers; supervision of the field work; checking the questionnaires on receipt at Iowa State College; editing the schedules; directing the coding; assisting with the compilation of tables. The person who held this position had one or more assistants throughout most of the study. A team of six workers assisted with the coding.
3. Director of statistical work, a statistician. The Statistical Laboratory was responsible for the sampling design and for the sampling aspects of the field work, such as locating segments, listing procedures, determining what constitutes a household or an eligible. It also assisted with setting up the code, with the punching of cards and with the compilation of tables. (Had the professional assistance of at least one person.)
4. Interviewers. Responsible for conducting the interviews in the different parts of the state. Generally one person was employed for each of the 20 areas.

FOODS USED IN DAILY DIETARIES

This study was concerned primarily with the foods, or food groups, which largely determine the nutritive quality of the diets of the people of this country. Each person interviewed reported all food eaten during the day preceding the interview. The information was recorded on the form shown in the appendix, p. 970. In addition, the menu of the meal immediately preceding the interview was also obtained, together with the number of servings eaten.

In the Family Food Plan¹ suggested by the U. S. Department of Agriculture, milk provides 73 percent of the calcium and 52 percent of the riboflavin. The green and yellow vegetables furnish 32 percent of the vitamin A value of the diet; citrus fruits and tomatoes supply 34 percent of the vitamin C. Other fruits and vegetables including potatoes contribute 30 percent of the vitamin C; meat, poultry, fish, eggs and legumes contain 30 percent of the protein. The quantities of these nutrients in other foods or groups of foods are such that the nutritional quality of the diet may be questioned if these foods, or food groups, are not included in liberal amounts each day.

Cereals form the basis of the diet; they contribute cal-

¹The "basic seven" food groups as set up by the Department of Agriculture and the War Food Administration as an aid to the nontechnical teaching of nutrition are as follows: (1) green and yellow vegetables; (2) citrus fruits, tomatoes and salad greens; (3) other fruits and vegetables; (4) milk, including all its recognized forms other than butter; (5) meats, fish, poultry, eggs, nuts and mature legumes including peanut butter; (6) breadstuffs and cereals—whole grain, enriched or restored; (7) butter and fortified margarine.

ories, protein, iron and some of the B vitamins. Inspection of the Iowa diets has indicated sufficient use of cereals together with fats, sugars and sirups. Therefore a fair assessment of the quality of the diet may be made by noting the use of milk; green and yellow vegetables; the vitamin-C-rich group of foods consisting of citrus fruits, tomatoes, melons and raw cabbage; and meats, poultry, fish, eggs and legumes. The following criteria were used in determining whether the diets were satisfactory, marginal or unsatisfactory:

Milk

- 2 cups—satisfactory
- 1 cup—marginal
- Less than 1 cup—unsatisfactory

Meat, Fish, Fowl or Substitute (Legumes, Cheese, Eggs)

- 1 serving meat, fish or fowl or two servings substitute—satisfactory
- $\frac{1}{2}$ serving meat, fish, or fowl or 1 serving substitute—marginal
- less—unsatisfactory

Green and Yellow Vegetables

- 1 serving—satisfactory
- $\frac{1}{2}$ serving—marginal
- less—unsatisfactory

Citrus Fruit, Tomato, Raw Cabbage, Melons and Green Leafy Vegetables

- 1 serving—satisfactory
- $\frac{1}{2}$ serving—marginal
- less—unsatisfactory

Other Fruits and Vegetables

- 3 servings—satisfactory
- 2 servings—marginal
- less—unsatisfactory

The following were regarded as green and yellow vegetables (those vegetables containing at least 1,000 International Units vitamin A per 100-gram serving) according to tables of food composition:

Asparagus	Beet greens
Broccoli	Carrots
Chard	Collards
Dandelion greens	Kale
Leaf lettuce	Mustard greens
Pumpkin	Spinach
Squash, winter	Sweet potatoes
Tomatoes (if not needed in citrus group)	Turnip greens

Under the other fruits and vegetable group, white potatoes were counted only once, regardless of the number of times they appeared in the daily diet.

Table 2 presents the percentage distribution of dietary ratings for the two population groups and for various subdivisions of the sample of two population groups.

TABLE 2. PROPORTIONS OF SPECIFIED GROUPS WITH DIETS SATISFACTORY, MARGINAL OR UNSATISFACTORY WITH RESPECT TO CERTAIN FOODS OR FOOD GROUPS.*

	Milk			Meat, fish or substitutes			Citrus fruit, tomato, etc.			Green and yellow vegetables			Other fruits and vegetables		
	Pct. S	Pct. M	Pct. U	Pct. S	Pct. M	Pct. U	Pct. S	Pct. M	Pct. U	Pct. S	Pct. M	Pct. U	Pct. S	Pct. M	Pct. U
Iowa total.....	28	29	43	96	3	1	53	9	38	43	3	54	61	24	15
Sex: Male.....	33	32	35	98	1	1	48	10	42	41	2	57	63	23	14
Female.....	24	26	50	93	4	3	58	8	34	44	4	52	60	25	15
Age: 17-19 years.....	58	19	23	96	3	1	53	5	42	41	4	55	65	18	17
46-58 years.....	20	32	48	96	2	2	53	10	37	43	3	54	60	26	14
Place of residence.....															
Open country.....	33	27	40	96	2	2	60	6	34	40	3	57	67	22	11
Rural places.....	28	31	41	94	3	3	53	7	40	42	2	56	61	22	17
Urban.....	25	29	46	96	3	1	48	12	40	45	3	52	58	26	16
Farming area.....															
Eastern Livestock.....	31	23	46	95	4	1	60	7	33	46	3	51	69	22	9
Southern Pasture.....	39	32	29	96	2	2	56	2	42	54	3	43	62	27	11
Western Livestock.....	24	34	42	96	2	2	43	12	45	38	2	60	60	24	16
Cash Grain.....	29	27	41	96	3	1	60	10	30	42	3	55	63	22	15
Northeast Dairy.....	26	28	46	95	2	3	49	8	43	39	4	57	51	27	22
Annual family income.....															
No information.....	29	27	44	95	2	3	62	8	30	49	3	48	60	24	16
Less than \$1000.....	30	26	44	88	10	2	39	7	54	42	2	56	53	33	14
\$1000-\$2000.....	22	33	45	94	4	2	48	8	44	41	4	55	60	23	17
\$2000-\$3000.....	30	26	44	98	1	1	55	9	36	40	3	57	61	22	17
\$3000-\$5000.....	35	28	37	94	2	4	52	11	37	38	1	61	64	24	12
\$5000-above.....	26	28	46	99	1	0	54	11	35	42	2	56	83	8	9

*Figures are percentages of people with satisfactory, marginal or unsatisfactory ratings. (Based on weighted figures derived from the actual sample totals from each zone, which have been pooled after being multiplied by the zonal weights to adjust for the varying sampling rates used among zones.)

S—Satisfactory. M—Marginal. U—Unsatisfactory.

Figure 2 shows the percentages of the sample respondents having diets satisfactory, marginal or unsatisfactory in terms of each class of food. More than 95 percent of the daily diets were adequate in the group of foods containing meat, fish, and substitutes such as eggs, cheese or legumes. Approximately 60 percent had diets adequate in other fruits and vegetables, while 50 percent had diets with sufficient amounts of citrus fruits, tomatoes, melons, or raw green vegetables. The proportion of daily diets with adequate quantities of green and yellow vegetables was less. The most conspicuous deficiency was in the use of milk, which was adequate in only about one-fourth of the menus.

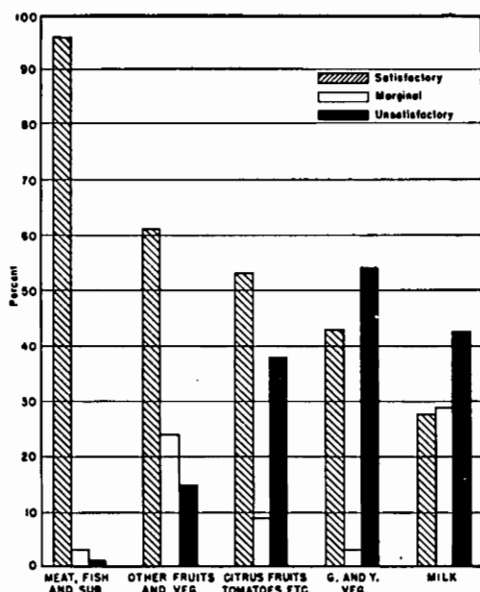


Fig. 2. Frequency of satisfactory, marginal and unsatisfactory diets of two population groups in Iowa with respect to certain food groups.

The dietary ratings for three food groups analyzed according to sex, age, place of residence and section of the state or farming area are shown in figs. 3, 4 and 5. The differences noted have not been examined statistically. Common observations of the day-to-day food habits of the Iowa people tend to confirm the findings.

ADEQUACY OF DIETS IN SPECIFIC FOOD GROUPS

MILK

The dietary ratings in milk varied considerably. (See fig. 3.) The most conspicuous difference occurred between the older and younger people. While only 20 percent of the older people had diets satisfactory in milk, 58 percent of the diets of younger people were satisfactory in this respect. The use of this food was more frequently satisfactory for men than for women and more frequently satisfactory for people

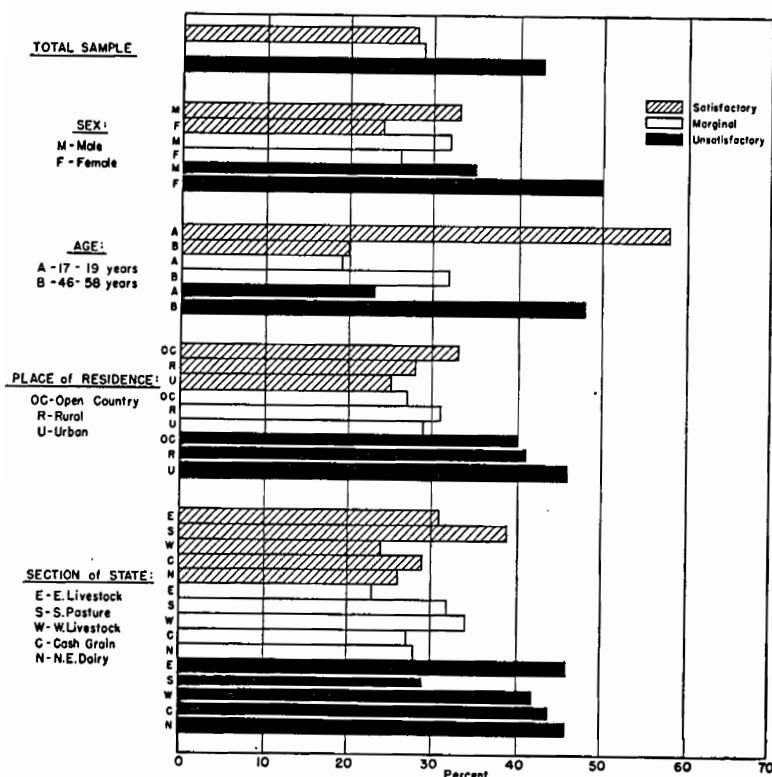


Fig. 3. Dietary ratings with respect to milk.

in the open country than in rural and urban places. Variations among different parts of the state were evident; more of the diets from the Southern Pasture area rated satisfactory and fewer of those of the Western Livestock and Northeast Dairy sections attained this rating.

MEAT, FISH AND SUBSTITUTE FOODS

The diets of all groups studied were generally adequate in meat, fish and substitute foods. This situation is particularly interesting when it is considered that the study was made during a period of meat scarcity and high prices.

GREEN AND YELLOW VEGETABLES

The most pronounced variation in use of green and yellow vegetables was apparent among sections of the state. (See

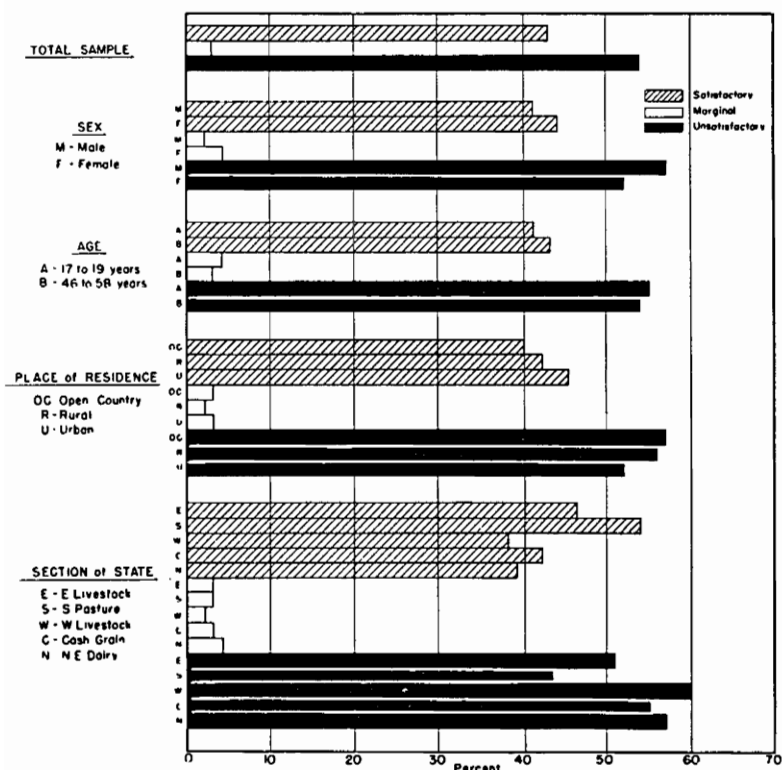


Fig. 4. Dietary ratings with respect to green and yellow vegetables.

fig. 4.) More of the people of the Southern Pasture area had diets which were satisfactory in the use of green and yellow vegetables while diets of the Western Livestock and Northeast Dairy sections were least satisfactory in this respect. Urban dwellers had the highest percentage of diets satisfactory in green and yellow vegetables, and people of the open country the lowest. Slightly more of the women than of the men had satisfactory diets in the yellow and green vegetables and conversely more of the men than of the women had unsatisfactory dietary ratings in this group of foods.

CITRUS FRUITS, TOMATOES, MELONS AND RAW CABBAGE

The dietary ratings in citrus fruits, tomatoes, melons and raw cabbage apparently varied with sex, place of residence, section of the state and income. (See fig. 5.) Proportion-

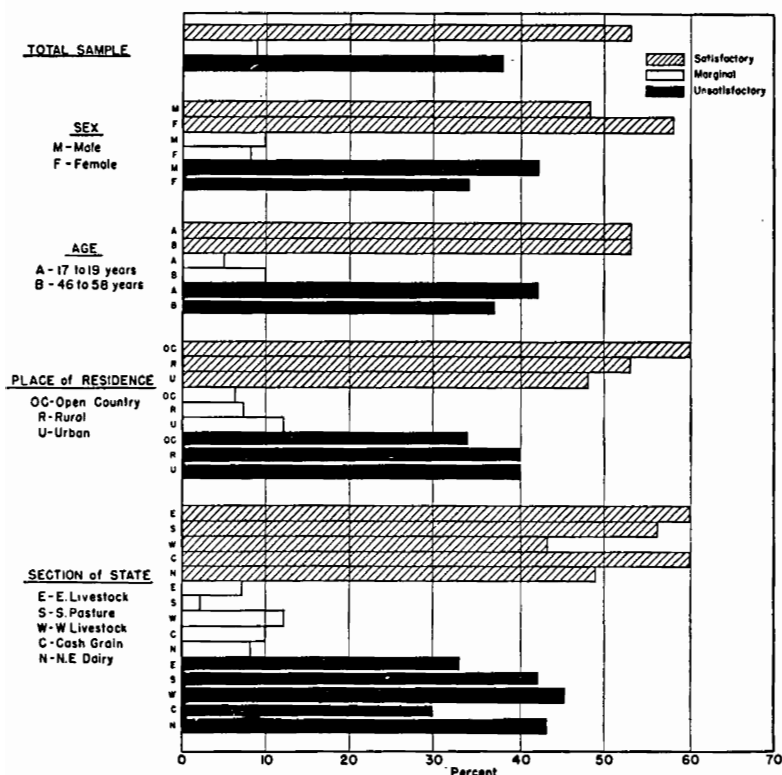


Fig. 5. Dietary ratings with respect to citrus fruits, tomatoes, raw cabbage or raw green vegetables.

ately more women than men had diets satisfactory in these foods. The percentage of satisfactory diets was greatest in the open country, next in rural places and least in urban places. The Eastern Livestock and Cash Grain areas had the same proportion of satisfactory diets, while the Western Livestock area had proportionately the fewest satisfactory and the most unsatisfactory ratings in this vitamin C group of foods. The proportion of satisfactory diets in vitamin C foods increased with the first three income levels. In each comparison many more diets were unsatisfactory than marginal.

OTHER FRUITS AND VEGETABLES

The sections of the state differed perceptibly in the use of other fruits and vegetables; the people of the Eastern

Livestock area had the highest proportion and those of the Northeast Dairy, the lowest proportion of diets satisfactory in other fruits and vegetables. No significant differences in the use of these foods were noted among the age and sex groups, nor for place of residence. Satisfactory practices seemed to increase in relative frequency with income. Marginal diets were more frequent than the unsatisfactory ones, which occurred with about 10 percent of the respondents regardless of classification. (See table 2.)

TABLE 3. PERCENTAGE DISTRIBUTION OF DIETARY RECORDS ACCORDING TO NUMBER OF FOOD GROUPS SATISFACTORY.

No. of groups Satisfactory	No. of records	Pct.
5.....	74	5.7
4.....	271	20.8
3.....	418	32.1
2.....	369	28.4
1.....	126	9.7
0.....	36	2.7
No information..	17	0.6
Total.....	1311	100 0

The scarcity of daily food records which contained satisfactory amounts of all five food groups was striking. Only about 5 percent attained this standard of excellence. Approximately one-fourth had diets satisfactory in four and five groups; one-third had diets satisfactory in three groups. The majority of records were satisfactory in three groups or less. Two of the three most satisfactory groups were meat and "other fruits and vegetables." (See table 3.)

FARMING AREA IN RELATION TO USE OF FOODS

More of the respondents of the Southern Pasture area than of other Iowa farming areas were found to have satisfactory diets. Diets of the people of Eastern Livestock and Cash Grain areas were intermediate, with the former probably somewhat better than the latter. Fewer of the people of the Northeastern Dairy and Western Livestock areas had diets satisfactory in the important food groups.

These observations are of interest when considered in relation to some facts pertaining to each area.² The Southern Pasture is generally considered lower than the other areas in standard of living. It has the largest proportion of land in permanent pasture, and livestock farming predominates. Fewer of the people here than in other sections of Iowa are descended from Central European and Scandinavian immigrants. Soil erosion and fertility depletion have taken a heavy toll of soil resources. This condition is reflected in relatively low corn yield in recent years. An additional handicap has been a decline in coal mining. Some

²Iowa Agr. Extension Service. Background of Iowa Agriculture. Feb. 1948.

30 percent of the farms are said to be too small to be economical units. Part-time farming is common. Probably of considerable significance is the fact that educational standards in the Southern Pasture area have been maintained at a high level relative to resources.

The Northeastern Dairy area presents a number of contrasts. It has attracted many foreign immigrants. In 1900 about 17 percent of the people were of foreign birth; half were Germans, Scandinavians, English and Irish. Although it might properly be called a hog-dairy area, milk production per acre is about 80 percent higher than in the Eastern Livestock and Cash Grain areas. In the Northeastern Dairy area 5.2 more cows per farm were milked than in any other area. In general, production has been the most stable and has in the past carried the lowest risk of any part of Iowa. Next to the Western Livestock area, the use of milk was least satisfactory in this area, and the general dietary level seemed poor as judged by the relative frequency of satisfactory diets.

The Western Livestock area specializes in producing hogs and cattle. As late as 1900 about 16 percent of the total population was foreign born. As much as 42 percent of all farm land, the highest proportion in the state, has been in corn at times. The dominant products are corn, hogs and beef.

Data indicating further facts about the different farming areas of Iowa, together with some dietary information, are given in table 4.

The apparent variations in the diets of the farming areas of Iowa cannot be directly correlated to the economic con-

TABLE 4. COMPARISON OF DATA CONCERNING THE FARMING AREAS OF IOWA AND DIETARY RATINGS.

	State average	N. E. Dairy area	Cash Grain area	Western Livestock area	Southern Pasture area	Eastern Livestock area
Percentage of adults with more than 8th grade education*	33	28	34	32	36	35
Value per acre of land and buildings**	\$ 105	\$ 92	\$ 132	\$ 114	\$ 60	\$ 109
Gross profits per 200-acre farm (1941-42)†		\$ 6080	\$ 7050	\$ 6240	\$ 4380	\$ 7260
Percentage of satisfactory diets:						
Milk.....		26	29	24	39	31
Green & yellow vegetables.....		39	42	38	54	46
Other vegetables and fruits.....		51	63	60	62	69
Citrus fruits, etc.....		49	60	43	56	60
Meat, etc.....		95	96	96	96	95

*Background of Iowa Agriculture, *op. cit.*, p. 32.

**Ibid., p. 42.

†Ibid., p. 38.

ditions observed in these areas. It may be significant that the better diets were observed most frequently in the area in which economic conditions are the poorest, educational standards are highest, and where the native stock is Old-American. Also striking is the fact that the use of milk is highly unsatisfactory in the region which is outstanding for its production of milk.

INCOME IN RELATION TO THE USE OF FOODS

In this study, no definite income group was conspicuous for its prevalence of good diets. The general trend was for the diets to be as satisfactory in the \$2,000-\$3,000 level as in the higher levels. A conspicuous exception to this observation was in the dietary ratings of other fruits and vegetables, which were most frequently satisfactory in the highest income level. The groups of foods most definitely income-linked appeared to be meats, the citrus group, and other fruits and vegetables. (See fig. 6.)

The satisfactory use of milk did not vary directly with income. Proportionately more satisfactory ratings were found in the lowest than in the next to lowest income levels. In the highest income levels (\$5,000 per year) the frequency of satisfactory diets was not much greater than observed with people whose incomes were \$1,000 to \$2,000.

With each group a large percentage of the respondents failed to give information about income. Exclusive of these respondents, the largest proportion of diets satisfactory in all five groups was found in the middle group, \$2,000 to \$3,000. This and the next lower income level had the highest proportion of diets satisfactory in four of the food groups. Diets satisfactory in only three, two or one food group occurred in greatest relative frequency in the second income level \$1,000 to \$2,000. The relative infrequency of diets with all groups satisfactory on the highest income level

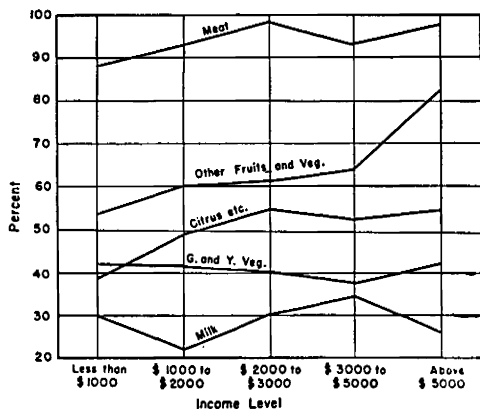


Fig. 6. Percentage frequency of diets satisfactory in certain food groups in relation to income.

TABLE 5. PERCENTAGE DISTRIBUTION OF SATISFACTORY RATINGS ACCORDING TO INCOME LEVELS.

No. of groups	No information on income	Less than \$1000	\$1000 to \$2000	\$2000 to \$3000	\$3000 to \$5000	\$5000 and above	No. of respondents
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	
5.....	43	5	7	22	11	12	74
4.....	31	7	19	19	14	10	271
3.....	37	9	24	17	7	6	418
2.....	27	10	23	21	10	9	369
1.....	26	15	29	16	10	4	126

suggests that proper food selection is not determined by income. There may be a similarity in the forces operating against a good diet on both the lowest and the highest income levels. It is conceivable that on the highest income levels, elaborate products made from flour, sugar and fat crowd out milk and vegetables to about the same extent that simple cereals must replace these foods on the low income levels.

NUTRITIONAL INADEQUACIES INDICATED

Some conception of the nutritive quality of the diets of these two population groups of Iowa may be arrived at by this analysis of the occurrence of certain important foods and food groups in their daily dietaries. Protein is probably consumed in adequate to liberal amounts. This observation is supported by the frequency of satisfactory diets in meat, or meat substitutes, considered together with the high basic consumption of cereal foods. Because of the low milk consumption, a large proportion of the people must have diets which are grossly inadequate in calcium and perhaps marginal in riboflavin. The failure to use green and yellow vegetables and milk raises a question regarding the dietary adequacy in vitamin A. The extensive use of butter may assure a marginal amount of this vitamin. Four to six servings of butter a day, plus an egg, will provide in a highly desirable form approximately one-third of the amount of vitamin A recommended for liberal diet. A fairly large proportion of the people also may ingest marginal or inadequate amounts of ascorbic acid or vitamin C.

The diets of the men are probably somewhat better than those of the women in protein, calcium and riboflavin, since the composition of diets with respect to these nutrients is considerably affected by the use of meats and milk, both of which were satisfactory for more of the men than of the women. Because of their more frequent use of vegetables and fruits, women probably had diets which were better than those of men in vitamin C and in vitamin A. The

people of the open country apparently have better diets than those in rural places or in urban areas. Those of younger people are undoubtedly better than those of older people in calcium and riboflavin.

Improvements in dietary practices were frequently noted as income levels advanced to \$3,000 (1946-47), but in calcium, particularly, the people of the highest income level apparently have no better supply than those with the lower family incomes.

The dietary evaluation with reference to farming section and to income suggests that production of crops for cash income may be associated with deterioration of the nutritional quality of the diet. Further studies designed to investigate this relationship would be of value in Iowa. It is conceivable that in efforts to increase the family income by field crops and livestock, people sacrifice the family cow and the garden. Moreover the failure of the people of the Northeastern Dairy section to make personal use of their abundant milk supply indicates that important foods readily available may be sacrificed for cash income. The general conversion of fluid milk to butter is a factor which may operate to diminish the home use of whole milk. There is as yet apparently little appreciation of the fact that the money obtained from the sale of milk cannot be invested to equal nutritional advantage in the purchase of other foods.

An obvious need for improvement in the food habits of Iowa people, as observed in this study of two population groups, is in the use of milk. An encouraging sign is the superiority of the practices of the young people over those of the older people in this respect. Whether or not the younger people continue in this commendable practice with advancing years is a question of importance. The extent to which the difference is due to educational programs is a matter of conjecture. It seems reasonable to believe that this has been a significant, if not an all-important, factor.

Improvement in dietary practices of Iowans, both young and old and in all sections, is also needed in the use of green and yellow vegetables and in the group of foods represented by citrus fruits, tomatoes, cabbage, melons and raw green vegetables.

TYPES OF MEALS USED BY THE TWO POPULATION GROUPS OF IOWANS

The meal is the primary unit by which people obtain their food. All plans for good nutrition must ultimately be interpreted through this medium. A better understanding

TABLE 6. ACTUAL NUMBER OF SCHEDULES USED IN ANALYSIS OF MEAL PATTERNS, CLASSIFIED BY PLACE OF RESIDENCE, SEX, AGE AND WEIGHT.

	Place of residence			Male		Female		Age group		Weight group			Total	
	O. C.	R.		17-19 yrs.	46-58 yrs.	17-19 yrs.	46-58 yrs.	17-19 yrs.	46-58 yrs.	Normal	Over-weight	Under-weight		
			U.											
Day preceding interview	B	373	410	469	114	491	141	506	255	997	709	228	315	1252*
	N	369	416	467	119	482	153	498	272	980	718	227	307	1252*
	E	370	422	479	119	493	152	502	271	995	722	231	313	1266*
	Sn	218	253	279	75	271	115	289	190	560	433	137	180	750
Meal immediately preceding interview	B	118	125	184	26	173	36	192	62	365	229	85	113	427
	N	149	156	213	62	195	64	197	126	392	300	82	136	518
	E	27	59	48	8	57	27	42	35	99	86	20	28	134
Preferred menus	B	87	107	122	29	130	33	124	62	254	...	...	...	316
	N	86	106	121	29	129	33	123	62	251	...	...	...	313
	E	88	105	121	29	129	33	122	62	252	...	...	...	314
	Sn	38	36	60	23	48	13	50	36	98	...	...	...	134

B, breakfast; N, noon meal; E, evening meal; Sn, snack.

*These figures do not equal 1311 because of lack of information or inability to analyze information given.

of the types of meals used by various groups of people is important to education for better nutrition.

Meals listed in the menu of the preceding day and the meal most immediately preceding this interview were analyzed for the use of certain foods and groups of foods. For study of types of menus preferred, a portion of the respondents were asked to give a day's menu which they would like to have if their food selection was unrestricted. The preferred meals used in this analysis were given for Wednesday, which was selected as a typical work day.

Foods occurring in the breakfast menus were grouped as follows: fruits, cereals (excluding breads), meats, eggs, breads other than hot breads, hot breads, beverages other than milk, milk, and finally a group consisting of jams, jellies, relishes, etc., hereafter referred to as food accessories. Foods occurring in noon and evening meals were classified as follows: appetizers, salads, meats, eggs, cheese, potatoes, green and yellow vegetables, other vegetables, bread, dessert, beverage other than milk, milk and the accessories. Examples of foods coded in the various groups are given in the appendix, p. 975.

The menus were coded, punched on IBM cards, and the results tabulated in several categories. The exact number of schedules used in most sections is shown in table 6.

MENU PATTERNS OF IOWANS AS REPRESENTED BY TWO AGE GROUPS

Bread and beverages, other than milk, were the breakfast foods used by three-fourths or more of the two population groups in Iowa. (See table 7 and fig. 7.) Slightly less than

TABLE 7. PERCENTAGE FREQUENCY* OF USE OF VARIOUS FOODS IN MEALS OF IOWANS OF TWO AGE GROUPS.

	Breakfast			Noon meal		Evening meal	
	I	II		I	II	I	II
	%	%		%	%	%	%
Fruit.....	46	41	Appetizer.....	10	14	9	14
Cereal.....	49	45	Salad.....	23	24	25	23
Meat.....	18	17	Meat.....	73	77	71	76
Eggs.....	42	42	Eggs.....	6	9	16	11
Bread.....	75	75	Cheese.....	9	5	8	10
Hot breads.....	16	13	Potatoes.....	57	57	61	60
Beverage (not milk).....	83	87	Green & yellow veg.....	29	26	23	31
Milk.....	15	14	Other vegetables.....	32	31	32	39
Accessories.....	12	14	Bread.....	77	87	75	84
			Dessert.....	73	68	69	73
			Beverage (not milk).....	58	60	58	58
			Milk.....	28	27	28	26
			Accessories.....	17	21	22	34

I—Foods included in meals of preceding day.

II—Foods included in meal most immediately preceding the interview.

*Based on weighted figures.

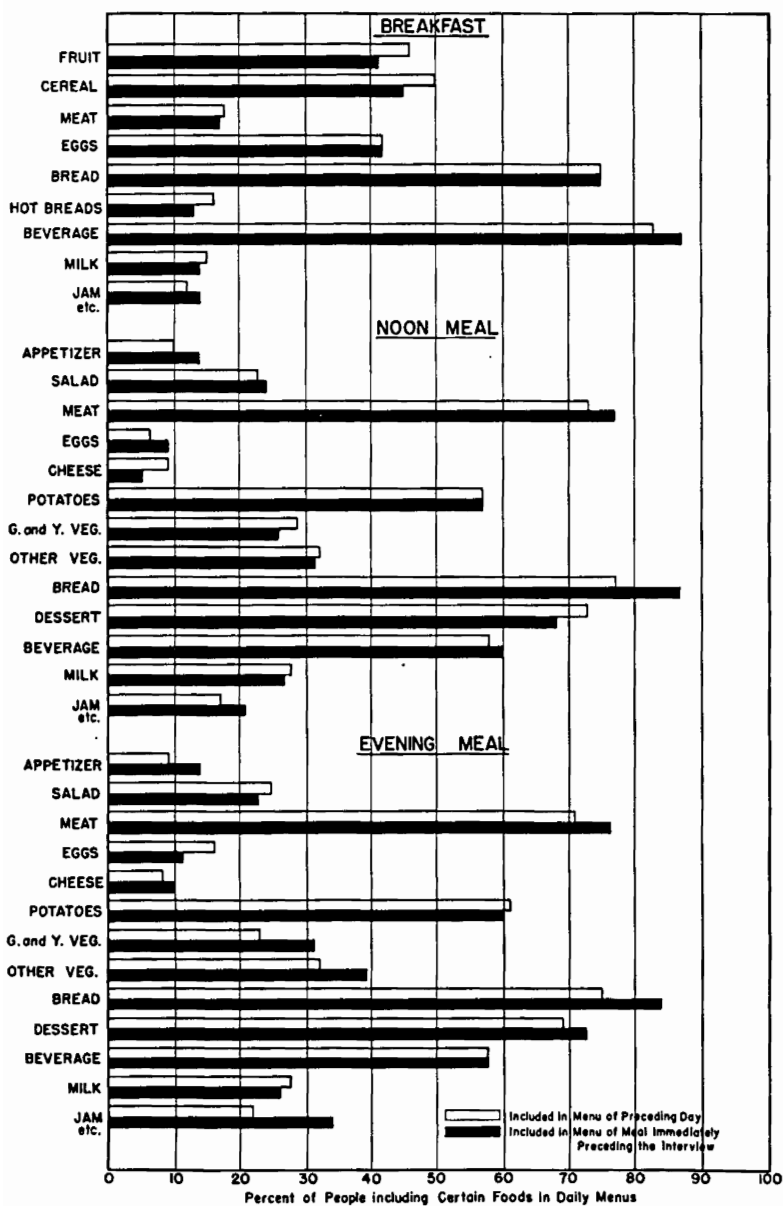


Fig. 7. Actual menus of two population groups of Iowa.

half of the people had fruit, cereal or eggs in addition. Milk, meat and accessories each appeared on the breakfast menu for 10 to 20 percent of the people represented in the study. Hot breads were used by about 15 percent.

Fruits were mainly grapefruit, oranges and tomato juice, in the order listed. Bread was chiefly white, and the beverage usually coffee. The hot bread most frequently listed was griddle cakes. Of the people who used breakfast cereal, 34 percent had rolled oats and 17 percent some type of wheat cereal. Seventy-seven percent of the meat listed for breakfast was bacon. Foods not represented in these items or groups occurred in only about 5 percent of the breakfast menus.

For the noon meal approximately three-fourths of the two Iowa populations represented had bread, meat and dessert; one-half had in addition potatoes and a beverage other than milk. Approximately one-fourth to one-third had each of the following: salad, green and yellow vegetable, another vegetable and milk. Less than one-tenth had eggs and cheese.

Evening meals resembled noon meals. Approximately the same proportions of the two groups of Iowans had the same foods, or food groups, at both meals. Eggs, potatoes and "other vegetables" were apparently used by more people in the evening than in the noon meal.

A comparison of the types of foods used in the meal preceding the interview with the types present in the corresponding meal of the preceding day indicates that the general pattern of Iowa meals is about the same from day to day within a season. One purpose of this phase of the study was to check the memory bias. If respondents consistently failed to recall the foods they ate the preceding day, the percentages reporting the use of various food items might be expected to be larger for the meal immediately preceding the interview than for the corresponding meal of the preceding day. Probably none of the differences between the percentages derived from the two records is significant.

MENUS IN RELATION TO AGE AND SEX

Certain differences apparently existed in menu types within the age and sex groups. The most conspicuous of these are shown in table 8.

At all meals the most striking difference with respect to age was in the use of milk; the differences were more pronounced at breakfasts than at other meals. At noon, more of the older people than of the younger had meals containing meat, potatoes and beverage other than milk. At the evening

TABLE 8. PERCENTAGE FREQUENCY* OF USE OF VARIOUS FOODS IN MEALS OF TWO POPULATION GROUPS OF IOWA PEOPLE CLASSIFIED ACCORDING TO AGE AND SEX.

	Breakfast							
	Male				Female			
	17-19 yrs.		46-58 yrs.		17-19 yrs.		46-58 yrs.	
	I	II	I	II	I	II	I	II
Fruit.....	41	33	41	42	57	40	48	43
Cereal.....	61	56	55	51	30	24	45	41
Eggs.....	46	44	47	48	31	41	39	37
Hot breads.....	28	15	16	12	17	15	12	12
Milk.....	51	52	9	9	39	50	5	5
Noon Meal								
Meat.....	69	77	76	85	70	64	72	72
Cheese.....	6	3	9	3	7	8	14	8
Bread.....	81	84	82	96	75	74	72	81
Dessert.....	81	67	73	70	77	59	69	68
Milk.....	64	49	22	23	45	60	19	14
Jam, etc.....	14	6	14	25	15	17	21	24
Evening Meal								
Meat.....	81	72	74	78	73	77	66	74
Eggs.....	15	0	17	14	7	8	18	11
Potatoes.....	82	93	62	63	62	54	53	54
Green and yellow vegetables.....	22	14	20	30	31	29	23	36
Dessert.....	77	57	69	80	59	59	69	77
Beverage (not milk).....	23	7	66	69	25	36	69	71
Milk.....	62	64	24	29	45	28	18	12

I—Meal included in preceding day's menus.

II—Meal immediately preceding interview; most recent meal.

*Based on weighted figures.

meal more of the older than of the younger people had eggs and nonmilk beverage.

The differences in food practices of the two sexes were more evident at breakfast than at other meals. More women than men used fruit for breakfast and fewer used milk. Fewer women than men had potatoes at the evening meal.

MENUS IN RELATION TO PLACE OF RESIDENCE

Menu variations with place of residence (open country, rural places and urban areas) are shown in fig. 8. These percentages were based on weighted figures obtained from the analysis of the menus of the day preceding the interview. The number of schedules used is shown in table 6.

Open country people of the two Iowa populations represented in this study apparently have heavier breakfasts than others, as indicated by the fact that larger percentages of this group than of the other groups had cereal, meat, eggs, hot breads and milk. More of the urban people had foods other than those listed.

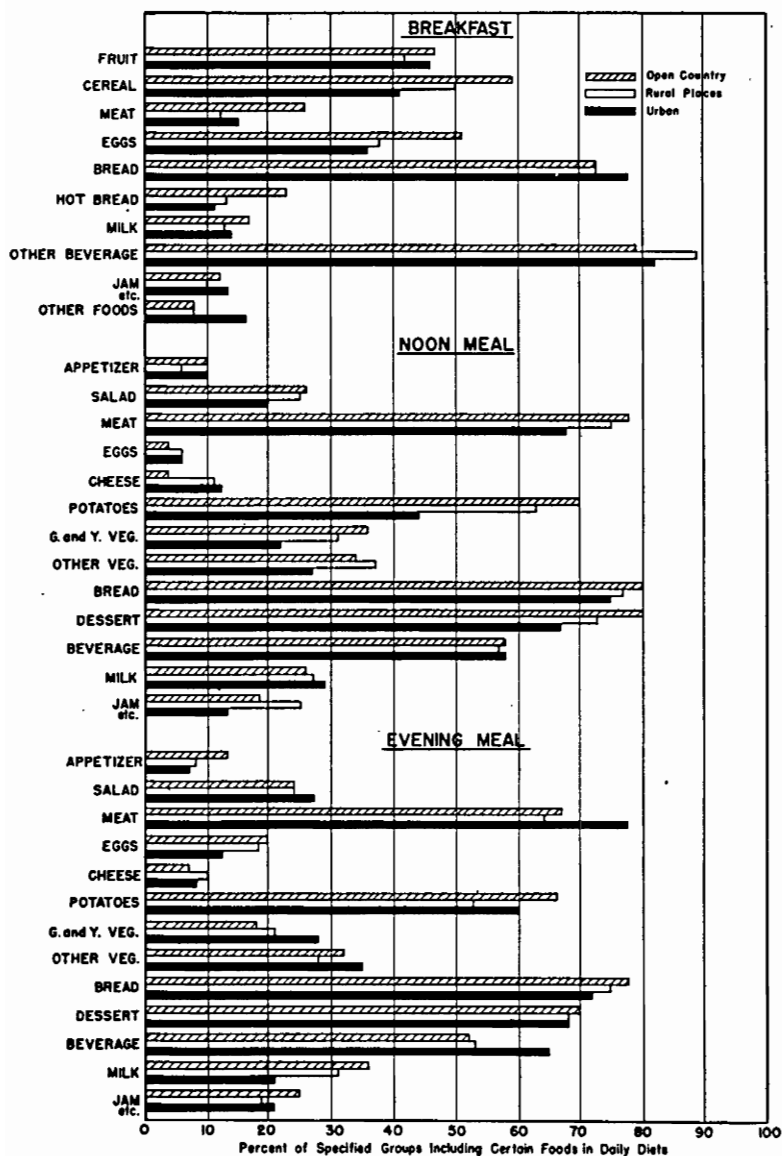


Fig. 8. Actual menus of two population groups of Iowa. Comparison based on place of residence.

The noon meals of people in the urban areas were apparently lighter than those in open country and rural areas, as shown by the smaller percentages of the respondents of this group who had salad, meat, potatoes, vegetables of both groups, bread, dessert and accessories. Cheese and milk were used at the noon meal by slightly larger percentages of the urban respondents than of those from the other areas. Types of foods used at the noon meal by respondents of open country and rural places were generally similar.

While people of the urban areas tended to have lighter noon meals than people of open country or rural areas, they tended to have heavier evening meals. At this meal larger percentages of the urban respondents than of the other groups had salad, meat, green and yellow vegetables, other vegetables, and beverages other than milk. A larger proportion of respondents of the open country and rural places than of the urban places used eggs for supper. More of the respondents of the open country used potatoes. Fried eggs and fried potatoes frequently comprised the bulk of the evening meal among this group.

For both noon and evening meals, potatoes were used by more, and cheese by fewer of the people of the open country than elsewhere. Proportionately more of the people in open country had desserts at both noon and evening meals. Meals including meat and green and yellow vegetables occurred most often at noon for open country and rural place people, and at evening for the urban people.

The types of meals used by people in rural places resembled closely those in the open country in frequency of use of bread and "other foods" for breakfast; of salads, meat, eggs, other vegetables, beverage and milk for the noon meal; and salad, meat, eggs and beverages for the evening meal. They resembled the meals of the urban population in the relative frequency of use of meat, eggs, hot breads and milk for breakfast; eggs and cheese at noon; and potatoes and food accessories in the evening. In 17 of the 36 items studied in the analysis of the three meals, the percentage of respondents from rural places was intermediate between the corresponding percentages from the open country and the urban places. For five additional items the rural place percentages were the same as those for one of the other two residence groups.

MENUS IN RELATION TO INCOME LEVELS

The percentages of respondents in the various income groups who used the specified groups of food in the three

meals were computed. Increasing with income were the frequencies of use of fruit and meat for breakfast, appetizers at noon meals and dessert at the evening meal.

The noon meals varied less with income than did breakfasts and evening meals. That is, the percentage frequencies of use of the food items fluctuated less among the five income groups for this meal than for the others.

The sharpest changes in meal components were noted for "\$1,000 and below," and for "\$5,000 and above." Differences were least marked for the \$2,000 to \$3,000 and \$3,000 to \$5,000 income groups. Approximately the same percentages of both groups reported the individual items studied.

MENUS IN RELATION TO BODY WEIGHT

Since deviation from normal weight is a physiological condition frequently associated with manner of eating, it was thought of interest in this study to investigate the frequency of use of foods according to the weight status. Respondents were asked to give their weight, and a gross estimation of whether or not the subject was underweight or overweight was made by comparison with the Baldwin Wood tables on standard weight³. Respondents whose weights were 15 percent or more in excess of the standard given for age, height and sex were considered overweight. Those whose weights were 7 percent below standard, or more, were classed as underweight.

The distribution of the schedules according to the weight of the respondent is shown in table 6. Percentages showing the frequency of use of each type of food were calculated as previously described, using figures weighted to represent the two age-populations studied.

The approximate incidence of underweight, overweight and normal weight, as previously described, in the two groups was as follows:

Normal weight	57 percent
Overweight	18 percent
Underweight	25 percent

Table 9 and fig. 9 enable a comparison of overweight and underweight with normal weight individuals with respect to the percentage frequencies with which the various foods were selected at the different meals. Each dot represents the percentage frequency of a definite food item or group. This comparison does not reveal outstanding differences among the practices of the normal weight, overweight and

³Rose, M. S. *A Laboratory Handbook for Dietetics*. 4th Ed. p. 58, 59, 62, 64. The MacMillan Company. 1937.

TABLE 9. PERCENTAGE FREQUENCY OF VARIOUS FOODS IN MEALS OF TWO POPULATION GROUPS OF IOWA PEOPLE CLASSIFIED ACCORDING TO WEIGHT.*

			I (Pct.)	II (Pct.)
Fruit	Breakfast	Normal weight	48	43
		Overweight	39	36
		Underweight	45	42
Milk	Breakfast	Normal weight	18	15
		Overweight	9	15
		Underweight	12	10
	Noon meal	Normal weight	28	27
		Overweight	20	23
		Underweight	32	28
Meat	Breakfast	Normal weight	29	26
		Overweight	25	25
		Underweight	29	28
	Noon meal	Normal weight	20	14
		Overweight	18	23
		Underweight	15	20
Bread	Breakfast	Normal weight	72	74
		Overweight	80	88
		Underweight	70	76
	Noon meal	Normal weight	77	76
		Overweight	58	68
		Underweight	68	83
Beverage (other than milk)	Breakfast	Normal weight	75	71
		Overweight	81	86
		Underweight	71	75
	Noon meal	Normal weight	75	86
		Overweight	75	84
		Underweight	83	89
Potatoes	Breakfast	Normal weight	77	86
		Overweight	69	86
		Underweight	75	78
	Noon meal	Normal weight	81	86
		Overweight	84	91
		Underweight	84	87
Salads	Breakfast	Normal weight	56	57
		Overweight	57	58
		Underweight	60	57
	Noon meal	Normal weight	63	63
		Overweight	52	48
		Underweight	61	61
Green and Yellow Vegetables	Breakfast	Normal weight	21	24
		Overweight	26	27
		Underweight	25	24
	Noon meal	Normal weight	26	24
		Overweight	25	21
		Underweight	23	22
Vegetables	Breakfast	Normal weight	30	25
		Overweight	23	29
		Underweight	31	28
	Noon meal	Normal weight	23	29
		Overweight	22	41
		Underweight	24	28

I—Included in preceding day's menu.

II—Included in meal immediately preceding interview.

*Based on weighted figures.

TABLE 9. (Continued.)

			I (Pct.)	II (Pct.)
Other Vegetables	Noon meal	Normal weight	32	30
		Overweight	33	34
		Underweight	31	32
	Evening meal	Normal weight	32	38
		Overweight	32	38
		Underweight	34	44
Dessert	Noon meal	Normal weight	73	72
		Overweight	71	70
		Underweight	74	57
	Evening meal	Normal weight	70	72
		Overweight	64	69
		Underweight	69	78

underweight. Fewer of the overweight than of the normal weight people reported the use of most of the food items in each of the three meals. Only in the noon meal was there an appreciable number of foods used by more of the overweight than by the normal weight. The underweight tended also to use less of the items, though this tendency was less pronounced with them than with the overweight. Differences in the reported use of snacks could not be associated with differences in weight. (See fig. 10.)

There is some evidence that the overweight tended to curtail their eating at breakfast by the less frequent use of fruit and milk, but that a greater proportion of this group than of the normal or underweight group had bread, other than hot breads, and beverages other than milk for breakfast. At the noon meal, meat, usually accompanied by gravy, was used by more of the overweight than of the normal or underweight. Since meat and its accessories often determine whether a meal is heavy or light, there is some evidence that noon meals of the overweight tended to be heavier than those of the other groups. Indications were, however, that the overweight subjects had lighter evening meals. Foods which seemed to be restricted by this group during this meal were meat, potatoes, desserts and possibly milk. There was no suggestion of increased use of vegetables and fruits by the overweight. However, variations between the percentages of respondents having the specified foods on two successive days were more marked for both the overweight and underweight than for the normal weight.

The types of meals eaten by the underweight were not different in the main from those of normal weight. Deviations, if any, were more evident in the evening meal. Slightly more frequent use of milk was made by the underweight group than by the other groups at both the noon and evening meals.

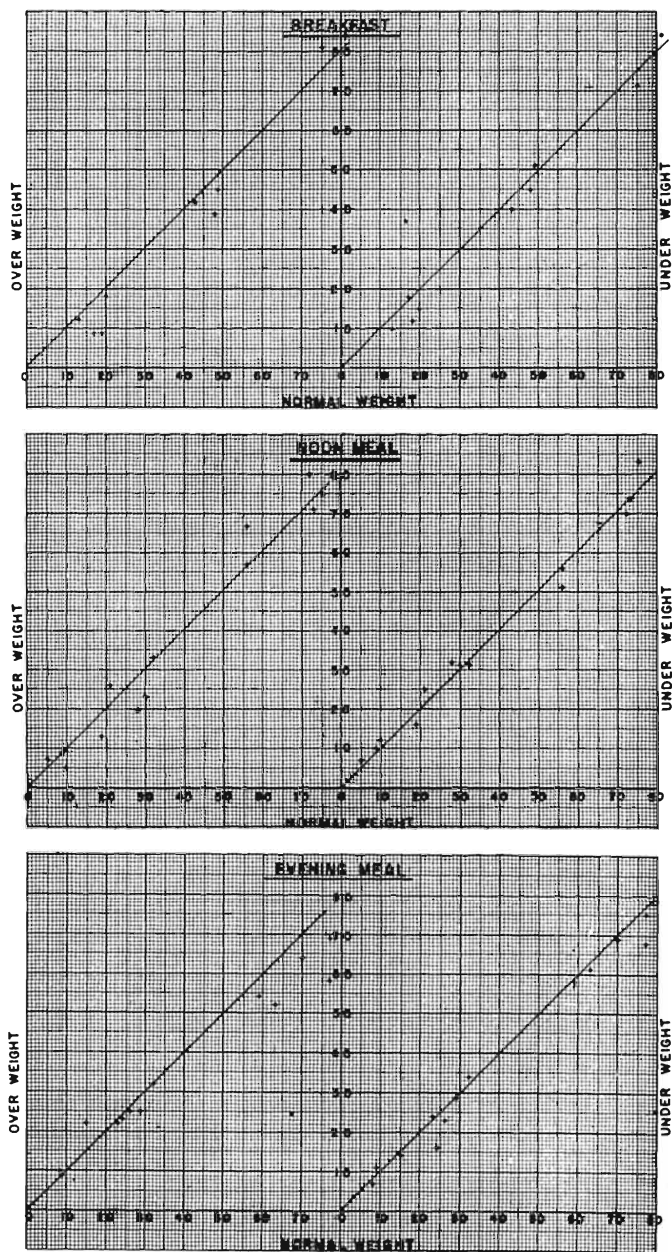


Fig. 9. Percentage frequency of use of certain food and food items by people of different weight status.

Present nutritional knowledge stresses the importance of the use of milk, vegetables and fruits by both underweight and overweight people. There is little indication that this information is being applied by Iowa people in these categories. Apparently milk is more highly favored by the underweight than the overweight. The

Iowa Food Habits study suggests the need for further education regarding diet in relation to body weight.

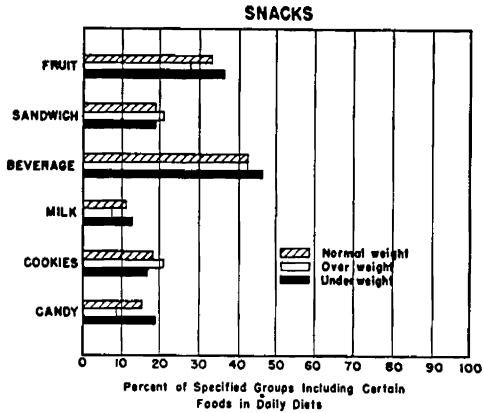


Fig. 10. Actual menus of two population groups in Iowa. Comparison based on weight.

MEALS IN RELATION TO PLACE WHERE EATEN

The respondents were asked to indicate the place where the meals were eaten. This information was recorded with each menu. Most meals were eaten in the home. More noon meals than other meals were eaten outside the home, but at most these did not exceed one-third of the total. Noon meals were eaten in a public eating place by about 10 percent of the people; the evening meals by about 5 percent; the breakfasts by about 2 percent. Approximately the same trend was observed whether the data were derived from the menus of the day preceding the interview (I) or from the meal immediately preceding the interview (II). (See table 10.)

A comparison of the percentage frequencies for types of foods included in the noon meals at home with those included in noon meals in public eating places is presented in table 11. The most striking differences between meals at home and in public places were in the use of cereal and food accessories for breakfast; meat, potatoes and another vegetable at noon; and meat in the evening. The home noon meals tended more frequently than those eaten in public places to have eggs, potatoes, other vegetables, milk and accessories; and less frequently to have meat. The use of milk, and possibly eggs, in meals outside the home was probably less satisfactory than that in home meals.

TABLE 10. FREQUENCY DISTRIBUTION OF SUBJECTS ACCORDING TO PLACE WHERE MEALS WERE EATEN.*

	Breakfast				Noon meal				Evening meal				Snacks	
	I		II		I		II		I		II			
	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	No.	Pct.	Pct.	Pct.
No information.....	174	14	39	9	175	13	16	3	181	14	12	9	301	
Home.....	1044	82	376	86	811	64	402	76	993	78	107	80	384	
Public eating place.....	23	2	12	3	123	10	49	9	57	5	8	6	50	
School.....	.....	.....	2	**	22	2	13	3	2	**	.....	.....	2	
Guest.....	19	2	5	1	58	5	19	4	30	2	7	5	16	
Picnic.....	.....	.....	.....	.....	5	**	2	**	1	**	.....	.....	.....
Packed lunch.....	.....	.....	.....	.....	66	5	20	4	10	**	.....	.....	.....
Total.....	1260		434		1260		521		1274		134		753	

I—Included in preceding day's menus.

II—Included in meal immediately preceding the interview.

*Percentages based on actual figures, not weighted.

**Greater than 0 but less than 1 percent.

TABLE 11. PERCENTAGE FREQUENCY* OF VARIOUS FOODS IN NOON MEALS OF TWO AGE GROUPS OF IOWA CLASSIFIED ACCORDING TO PLACE EATEN.

	Noon meal			
	Home		Public eating place	
	I	II	I	II
Appetizer.....	10	12	14	24
Salad.....	23	23	21	32
Meat.....	59	75	82	81
Eggs.....	6	11	1	4
Cheese.....	6	4	7	6
Potatoes.....	63	61	34	36
Green and yellow vegetables.....	31	25	17	28
Other vegetables.....	35	38	8	10
Bread.....	76	87	73	75
Desserts.....	80	66	66	71
Beverage.....	57	62	65	75
Milk.....	27	27	22	17
Accessories.....	18	31	12	8

I—Noon meal from preceding day's menu.

II—Noon meal immediately preceding interview.

*Based on actual figures, not weighted.

MENUS IN RELATION TO SIZE OF GROUP EATING TOGETHER

The types of meals eaten may vary with the number of people in the family group and customarily eating together. Respondents were asked, "How many people regularly ate their meals at your house in the past year?" The number of schedules used in this analysis and the percentage distribution of the respondents with reference to the size of group eating together are shown in table 12.

Only a small percentage of the group customarily ate alone. The most frequent group size was two, and the next most frequent three.

Among the people eating alone, smaller percentages had each of the foods listed for breakfast except possibly bread. At the noon meal a larger proportion of this group than of other sized groups had beverage other than milk, soup,

TABLE 12. STUDY OF MENU ACCORDING TO SIZE OF GROUP EATING TOGETHER.*

	Breakfast		Noon meal		Evening meal	
	No.	Pct.	No.	Pct.	No.	Pct.
No information.....	255	20	258	20	234	19
1 person.....	22	2	18	2	23	2
2 persons.....	301	24	290	23	301	24
3 persons.....	213	17	215	17	220	17
4 persons.....	168	13	173	14	172	14
5 persons.....	138	11	138	11	140	11
6 or more persons.....	163	13	168	13	170	13
Total.....	1260		1260		1260	

*Percentages based on actual figures, not weighted.

eggs, meat and accessories; a small proportion had milk, desserts and salads. For the evening meal a higher percentage of this group had dessert, beverage other than milk, and green and yellow vegetables; and a strikingly smaller percentage had milk.

Among the groups containing more than one person (for which a more comparable number of schedules was available), a few fluctuations were noted. The percentage of each group using milk tended to increase with the size of the group, though with six or more people in the unit, the proportionate frequency decreased at all meals. The relative frequency of the use of eggs at breakfast and at the noon meal remained fairly constant regardless of the size of the group. A tendency to depend on eggs for the evening meal decreased with the larger family groups. Relationships of family size to the use of meat at breakfast and noon meals were irregular, but in the evening meal the relative frequency of the use of this food increased with the size of the group. The frequency of use of desserts at the noon meal showed little variation, but in the evening meal it increased with family size. At breakfasts hot breads were used more frequently in groups of four and more. Concurrently the use of other breads decreased. The proportionate use of cereals, however, was nearly constant for all sized groups. The use of fruits decreased with the size of the unit. The use of potatoes, both at noon and evening meals, was generally more frequent with the larger groups.

FACTORS INFLUENCING SELECTION IN RELATION TO TYPES OF MEALS

An effort was made to study the types of foods used in relation to the factors which respondents said influenced them mainly in their food selection. The question asked was, "What are the most important factors which limit or restrict the food for your family?"

The two main factors influencing food selection, as recognized by respondents, were availability and expense. Preference was considered as a principal factor for about one-eighth of the group and health by slightly less than one-tenth. The distribution was:

Key No.	No.	Percent
0—no information	357	28
<i>Availability</i>		41
1—availability only	217	17
5—availability and expense	239	19
6—availability and health	24	2
7—availability and preference	31	3

<i>Expense</i>		40
2—expense only	196	16
5—expense and availability	239	19
8—health and expense	25	2
9—expense and preference	37	3
<i>Health</i>		8
3—health only	48	4
6—health and availability	24	2
8—health and expense	25	2
<i>Preference</i>		12
4—preference only	86	7
7—preference and availability	31	2
9—preference and expense	37	3

An analysis of the food actually used in relation to the factors mentioned failed to reveal any apparently significant relationships. For example, the percentage of respondents who regarded health as an influencing factor in food selection did not use milk much more than others. In other words there seemed to be little relationship between the stated factor influencing choice and the actual choices.

COMPARISON OF PREFERRED WITH ACTUAL MENUS

In the course of the interview approximately one-fourth of the respondents were asked to give a full day's menus of the type they would like to have if they had no restrictions in their food selection.

Some of the results are presented graphically in fig. 11.

For breakfasts, more people prefer fruits, meat, eggs, beverage other than milk and bread than actually have these foods. For the noon meal a greater proportion prefer salad, meat, potatoes, green and yellow vegetables, dessert and beverage other than milk. For the evening meal proportionately more prefer salad, meat, potatoes, green and yellow vegetables, dessert and beverage other than milk, and bread. Beverages were the preferred snack, as well as the snack most frequently used.

Most foods would be used by more people, if preferred menus were followed. The exceptions were cereal, bread for some of the meals, other vegetables, and most significantly, milk. At no meal was milk listed more often in the preferred than in the actual menus, when the total sample was considered. Preferred snacks included milk somewhat more frequently than did the actual snacks.

There was less difference between preferred and actual practices among people in the open country than elsewhere. People in the open country are apparently more likely to

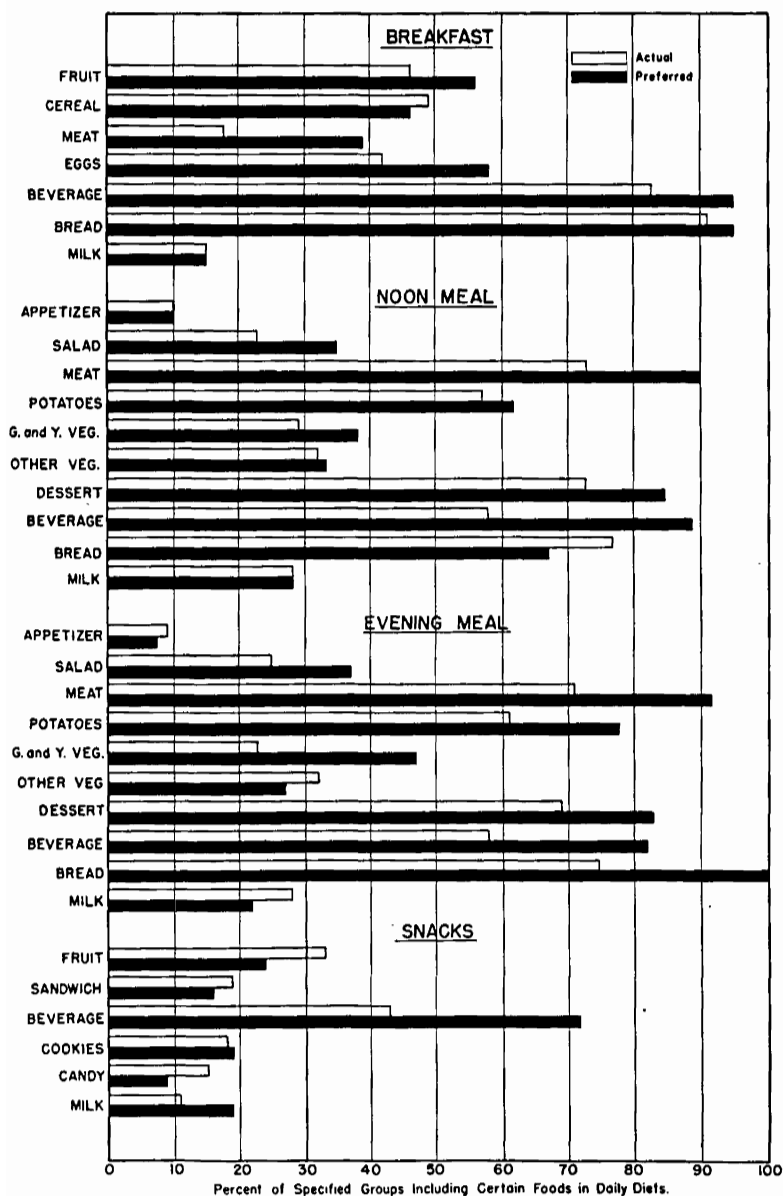


Fig. 11. Actual and preferred menus of two population groups of Iowa.

have about what they prefer, or to prefer what they have, than are people living elsewhere.

Inspection of data further suggests that preferred menus of the urban people might more nearly attain nutritional standards than those of the people in rural places and in the open country. The possibility of improvement is indicated particularly in the evening meal by the desire for more frequent use of green and yellow vegetables, and at breakfast by the desire for more frequent use of milk. Nevertheless it seems fairly evident that less than 50 percent of the people would have menus of the type commonly recommended for good nutrition, if they had free choice of all foods. Preferred, like actual menus, are predominantly meat, potatoes, beverage and bread.

In other words, differences between preferred and actual menus suggest that with restrictions in food selection removed, the increases would be mainly in the food groups now most frequently used. The consumption of green and yellow vegetables would be slightly, though not spectacularly, improved, while the change in use of milk would be very small. The most undesired foods according to the criteria here used are cereals, vegetables other than potatoes, or other than green and yellow, and milk. Dietary improvements through more frequent use of green and yellow vegetables, salads and eggs would seem to be in accordance with the expressed preferences of considerable proportions of the people of all groups studied.

A study of the preference data classified according to age and sex of respondents revealed the differences similar to those found in the respondents' actual use of foods. A larger proportion of older women would like fruit for breakfast than had it, and a larger proportion of the younger people would like milk. By all groups except the older women, cereals were included in fewer preferred than actual breakfasts. At noon, milk appeared less frequently for men and more frequently for women on the preferred than in the actual menus. Differences between actual and preferred menus for this meal were apparently greater for the younger than for the older people. In the evening meal, milk occurred more frequently on the actual than on the preferred menus for men; with women milk was included as often on the preferred as on the actual menus. The evening meal appears to be the place where the greatest improvement could be made in the use of green and yellow vegetables.

The greatest difficulties in changing the food habits of the people may be encountered in open country, as judged

by the differences between preferred and actual menus with respect to foods for which consumption should be increased. It will be remembered, however, that the diets of the people of this group may already be superior to those found in other sections.

SAMPLE MENUS

Individual menus may vary considerably from the statistical averages. Information which is not revealed in the analyses of data thus far made can be obtained from the study of these. A random selection was made of a few of the dietaries for the purpose of obtaining sample menus from the collection. These are presented together with some of the data regarding the respondents in the following case studies.

CASE NO. 1

Young woman—17 years old, weight 115 pounds, telephone operator.

<i>Breakfast</i>	<i>Noon Meal</i>	<i>Evening Meal</i>	<i>Snacks</i>
Orange juice	Vegetable soup	Sausage	
Wh. toast, bu.	Crackers	Pork and beans	
Cream of wheat	Chocolate	Wh. bread and	
Milk, $\frac{1}{2}$ c.	malted milk	butter	
		Jelly	
		Milk	
		Cranberry	
		sauce	

CASE NO. 2

Young woman—17 years old, weight 139 pounds, society editor for newspaper.

Hot chocolate	Bread	Potatoes	Candy bar
Malted milk	Milk, 2 glasses	Sauerkraut	Hamburger
	Bean and	Butter	Ice cream
	bacon soup	Milk, 2 glasses	Popcorn
	Apple		Apple
			Ice cream

CASE NO. 3

Young man—17 years old, student, weight 165 pounds.

Orange juice	Roast pork	Roast beef	Crackers
Banana	Apple sauce	Gravy, potatoes	Grapes
Dry cereal with	Potatoes,	Broccoli	
cream	mashed	Wh. bread	
Toast, butter	Gravy	Banana	
	Vegetables,	Milk, 3 glasses	
	buttered		
	Rolls, butter		
	Milk		
	Cherry pie		
	a la mode		

CASE NO. 4

Young man—18 years old, student, weight 230 pounds.

<i>Breakfast</i>	<i>Noon Meal</i>	<i>Evening Meal</i>	<i>Snacks</i>
Pancakes	Sandwich	Pork chops	Bread
Karo syrup	Vegetable	Baked beans	
Fried egg	Fruit	Potatoes,	
Grapefruit	Milk, 2 glasses	mashed	
Milk, 2 glasses		Peaches, bread	
		Milk, 2 glasses	

CASE NO. 5

Young man—18 years old, student, weight 175 pounds.

Grapefruit	Potatoes,	Steak
juice	mashed	Potatoes
Pancakes	Meat, gravy	Beans
Bacon	Whole wheat	Apple salad
Coffee	sandwiches	Carrots
Milk	Carrot sticks	Bread, butter
	Cake, milk	Bananas
		Cookies, milk

CASE NO. 6

Young man—17 years old, student, weight 140 pounds.

Oatmeal	Tea	Beef	Chocolate
Pancake		Potatoes	candy bars
Syrup		Vegetable	any time
		Bread, butter	of day
		Jelly	
		Mince pie	

CASE NO. 7

Woman—56 years old, weight 145 pounds, homemaker, income level of family \$2,000-\$3,000 yearly; home alone at noon.

Orange	Tea	Pork shoulder
Buckwheat	Bread, butter	Mashed
cakes	jelly	potatoes,
Karo syrup	Peaches	gravy
Coffee, cream		Bread, butter
		Strawberries
		Coffee, cream

Ailments: Chronic constipation, muscle and joint pains, neuritis, peptic ulcer, rheumatism, false teeth, difficulty in mental application, occasional illness.

CASE NO. 8

Woman—56 years old, weight 120 pounds, manager of sandwich shop, income level of family \$1,000-\$2,000, mother of one child.

Waffles	None	Chicken, fried	Seldom
Syrup		Potatoes, fried	snack
Coffee		Slaw	
		Cottage cheese	
		Apple sauce	
		Buttered peas	
		Banana cake	
		Coffee	

Ailments: Occasionally ill; few decayed teeth.

CASE NO. 9

Woman—48 years old, weight 175 pounds, factory worker, income level of family \$1,000-\$2,000, mother of 2 children.

<i>Breakfast</i>	<i>Noon Meal</i>	<i>Evening Meal</i>	<i>Snacks</i>
Coffee with milk	Creamed ham	Vegetable soup	
Banana	Potatoes	Apple pie	
Chicken gravy	Gravy	Coffee with milk	
Bread	Custard		
	Coffee with milk		

Ailments: Subject to chest and throat colds, inflamed and bloodshot eyes, goiter, nervous and irritable, occasionally ill.

CASE NO. 10

Woman—52 years old, weight 116 pounds, employed as a houseworker, income less than \$1,000 per year; lives with mother.

Oatmeal with milk, sugar	Beef	Sandwich
	Noodles	Coffee
Bacon	Coffee	
Egg		
Toast		
Coffee		

Preferred menu almost identical with the actual menu. Ailments: Frequent headaches, nervous and irritable, bruises easily.

CASE NO. 11

Woman—51 years old, weight 202 pounds, housewife, mother of six children.

Toast, 1 slice	Fried pike	Potatoes, fried
Puffed rice	Potatoes, boiled	Bologna
with sugar, milk	Corn, creamed	Ice cream
Coffee, cream	Bread, butter	Cake, coffee
	Jello, cake	
	Coffee, cream	

Ailments: High blood pressure, chronic constipation, gall bladder trouble, false upper teeth.

CASE NO. 12

Woman—51 years old, 115 pounds, factory worker, mother of three children, annual income \$2,000-\$3,000.

Grapefruit	Potatoes, fried	Navy beans,
Pancakes	Tomatoes	bacon
Bacon	Bread, butter	Corn bread,
Coffee	Pecan rolls	gravy
		Bread, butter
		Jelly

Ailments: Allergy, bruises easily, goiter, hernia, false teeth.

CASE NO. 13

Man—55 years old, 200 pounds, mechanic, income \$1,000-\$2,000.

Toast	Side pork, fried	Pork chops
Fried egg	Potatoes, gravy	Potatoes, fried
Coffee	Pumpkin pie	Bread, butter
Wheaties	Coffee	Coffee

Ailment: Obesity, teeth gone.

CASE NO. 14

Man—50 years old, 220 pounds, does odd jobs.

<i>Breakfast</i>	<i>Noon Meal</i>	<i>Evening Meal</i>	<i>Snacks</i>
Oatmeal, milk	Pork chops	Liver, gravy	Coffee
Wh. bread,	Potatoes,	Potatoes,	Sandwiches
cheese	mashed	mashed	Cookies
Tea	Vegetable,	Wh. bread	Cake
	butter	Coffee, pear	
	Coffee, apple	sauce	
	pie		
	Wh. bread,		
	butter		

Ailments: Occasional colds, swollen gums, many decayed teeth.

CASE NO. 15

Man—46 years old, 175 pounds, school custodian.

Banana	Beef ribs	Steak
Orange	Potatoes	Mashed potatoes
Cereal, milk	Gravy	Gravy
sugar	Peas	Bread, butter
Wh. bread,	Wh. bread	Green beans
butter	Rice pudding	Banana pie
Coffee, with	with cream	Coffee with milk
milk, sugar	Coffee	

Ailments: Teeth very defective but not all out; stomach ulcers.

CASE NO. 16

Man—52 years old, weight 165 pounds, farm operator, income \$3,000-\$5,000.

Orange	Pork roast	Egg	Coffee
Cereal with	Potatoes, gravy	Wh. bread,	with cream
syrup, cream	Green beans	butter	Cookies
Egg	Wh. bread,	Coffee, cream	Wh. bread,
Toast, butter	butter	Peaches	butter
Coffee with	Applesauce		
cream	Peaches		
	Coffee with		
	cream		

CASE NO. 17

Man—49 years old, weight 203 pounds, banker.

Tomato juice	Potato, baked	Potatoes, fried	Pepsi-Cola
Cereal	Chicken, baked	Rabbit	
Rye bread,	Tomatoes, raw	Gravy	
butter	Rye bread,	Rye bread	
Tea	butter	Lettuce	
	Tea with sac-	Apple, baked	
	charine	Tea	
	Apple, baked		

CASE NO. 18

Man—50 years old, weight 160 pounds, income \$2,000-\$3,000.

<i>Breakfast</i>	<i>Noon Meal</i>	<i>Evening Meal</i>	<i>Snacks</i>
Egg, fried	Split pea soup	Sausage	
Toast	with pork	Egg, fried	
Coffee, cream	Crackers	Milk, 1 glass	
and sugar	Cranberry	Wh. bread	
Cereals, sugar	salad	Coffee, sugar	
and cream	Apricots	and cream	
	Coffee, cream		
	and sugar		

Ailments: Occasional sickness.

Generalizations made in the analysis of the mass data were found to apply to these randomly selected dietaries. Milk, as such, appears frequently on the menus of the younger people, but not on those of the older group. Few of the latter use it in any way except in food preparation. In this respect the small amounts obtained in gravy or on cereals constitute most of that which is consumed. Vegetables are usually buttered, and milk desserts are rare.

The infrequent use of green and yellow vegetables is also evident. Examples of gross inadequacy in the use of this class of foods are apparent in the dietaries of cases 1, 2, 6, 7, 9, 10, 11, 12 and 13. Potatoes appear once in almost every dietary and sometimes twice. Other types of vegetables are not generally used.

While the menus appear to contain enough food, meals are occasionally missed. In this group, noon meals were as frequently missed as breakfasts. Indulging in snacks did not seem to be a frequent practice. People who had snacks seemed likely to have them several times a day.

Inspection of the menus suggests that there is little systematic planning of meals. Few menus are found which conform to the principles of menu planning usually taught. Evidences of gross inadequacies are startling, as in case of No. 10, whose preferred menu was almost identical with the actual one reported.

Investigation of the cases reveals problems which occur with certain groups of people. For example, inspection of the sample menus indicates that many young women, whether employed or not, have poor diets and that economic stress may frequently be a contributing factor. The food habits of case No. 2 illustrate a need for improvement. Although her meals included an abundance of milk, there were conspicuous shortages in green and yellow vegetables, citrus fruits, and even meat. Young women comprise a critical group whose diets should be excellent and whose food habits probably need considerable improvement.

The extent to which the menus of Iowans have changed in the last 50 years may be noted by a comparison of these menus with the following menus, which were obtained by Dr. J. Fred Clark in 1898.⁴

A FARMER

Breakfast, 7 a.m.

Fried salt pork
Fried potatoes
Apples fried in
butter and sugar
Wheat bread
Butter
Melted sugar syrup
Plum butter
Coffee

Dinner, 12 noon

Boiled beef
Boiled potatoes
Stewed tomatoes
Wheat bread
Butter
Pickles
Grape jelly
Canned raspberries
Berry pie
Coffee

Supper, 6 p.m.

Boiled beef, sliced
cold
Poached eggs
Fried potatoes
Wheat bread, butter
Sugar syrup
Plum preserves
Canned cherries
Cake, tea

AN UNSKILLED LABORER

Breakfast, 6 a.m.

Griddle cakes
Wheat bread
Butter
Grape jelly
Coffee

Dinner, 12 noon

Fried ham
Wheat bread, butter
Boiled potatoes
Baked apples
Pudding

Supper, 6 p.m.

Wheat bread
Butter
Oatmeal, milk
Apple pie

A BANKER

Breakfast, 8 a.m.

Oatmeal and prunes
Hamburg steak
(beef) fried
Buckwheat cakes
Coffee

Dinner, 12 noon

Roast beef
Mashed potatoes
Baked squash
Wheat bread
Butter
Pickles
Mince pie

Supper, 6 p.m.

Cold roast beef
Cranberries
Wheat bread, butter
Canned peaches
Cake, tea

Comparison of these with the menus of case No. 16, a farm operator; case No. 13, a mechanic; and case No. 17, a banker, reveals that the meals of today, particularly for the farmer, consist of fewer foods. Food accessories do not appear as often on the menus now as then; and desserts, which are now less frequent, do not always take the form of pie or cake. Fruits, which in the menus of 1898 were served in addition to pie and cake, when used on today's menus, often replace these foods as desserts.

The high degree of preference for meat, potatoes, dessert and beverage was evident then as now. There is little evidence of improved practices in the use of milk and little difference with respect to green and yellow vegetables and

⁴Clark, J. Fred. What the People of Iowa Eat. Medical News, LXXII:193-196, Aug. 13, 1898.

citrus fruits, melons and raw cabbage. Tomatoes, fortunately, have long been a favorite in Iowa, as shown by these early menus.

Considering the wide variety of foods used, it is possible that the actual nutrient quality of the diets of 1898 may have been superior to those of 1948. In view of the reduced exercise brought about by use of mechanical equipment and improved farm management practices, the reduction in quantity of food may be considered a desirable change.

Through a questionnaire sent to a large number of people of Jefferson County, Dr. Clark obtained the following information: The principal meal was at noon. Meat was eaten nearly universally three times a day. It was fried for breakfast, boiled or roasted for dinner, and sliced cold or fried for supper. In the country the meat was usually pork in the summer and pork and beef in the winter; in town beef was more generally used. Potatoes were eaten at two meals a day. For dinner they were boiled, and for breakfast or supper they were sliced and fried. Yeast bread, made of white flour, was considered the most important article of the diet. Oatmeal was eaten once or twice a week, cornmeal and hominy but little. Fruits were said to be eaten abundantly, and the green and yellow vegetables were eaten freely in the summer but sparingly in the winter. The importance of milk may not have been recognized since no comment was made about its failure to be included in the diets.

In many respects these observations are similar to those of this study. How much progress has been made in improving food habits in Iowa in the 50 intervening years? It seems scarcely commensurate with the increased knowledge in the field of nutrition, the large expenditures which have been made for education, and the improved facilities for food conservation.

APPETITE LEVELS OF TWO POPULATION GROUPS OF IOWA PEOPLE

Better selection and better use of food demand more knowledge regarding the attitudes of people toward foods. The schedule developed by the Quartermaster Food and Container Institute was planned to obtain information concerning the degree of preference for a large number of food items. In this schedule respondents indicated their degrees of preference by the terms, "very good," "good," "moderately good," "tolerated," or "disliked." Foods not

TABLE 13. DISTRIBUTION OF RESPONDENTS ACCORDING TO PART OF SCHEDULE ON APPETITE LEVELS, WITH RESPONDENTS CLASSIFIED BY NATIONALITY OF MOTHER AND PLACE OF RESIDENCE.

	Sample number	Nationality of Mother					Total
		U. S.	British Isles	Scan.	C. & W. Europe	Others	
Part I							
Open Country.....	106	33	20	7	45	1	365
Rural Places.....	120	24	29	15	46	6	
Urban.....	139	24	29	9	64	13	
Total.....		81	78	31	155	20	
Part II							
Open Country.....	90	14	16	13	46	1	307
Rural Places.....	97	14	16	19	42	6	
Urban.....	120	34	31	10	30	15	
Total.....		62	63	42	118	22	
Part III							
Open Country.....	90	15	23	10	41	1	318
Rural Places.....	106	29	27	9	40	1	
Urban.....	122	26	28	4	51	13	
Total.....		70	78	23	132	15	
Part IV							
Open Country.....	94	22	17	11	41	3	321
Rural Places.....	111	28	28	8	45	2	
Urban.....	116	24	31	16	25	20	
Total.....		74	76	35	111	25	
Total							
Open Country.....	380	84	76	41	173	6	1311
Rural Places.....	434	95	100	51	173	15	
Urban.....	497	108	119	39	170	61	
Grand Total.....		287	295	131	516	82	

tried, or those to which the respondents were allergic were also recorded in the schedule. These degrees of preference are spoken of as appetite levels.

Additional information was obtained concerning the actual and desired frequencies of use of each food, preferred methods of preparation and varieties, and the reasons for the attitude expressed. The present analysis is confined to the appetite levels of certain food items and groups of foods, and the reasons for the stated attitudes toward these foods. The data were studied for the two population groups of Iowa taken together, for subdivisions according to age, sex, place of residence and nationality of parents.

The length of the schedule rendered inadvisable its use as a whole with every respondent. Therefore, an abbreviated list of food items and groups was given to all respondents, and in addition one-fourth of the schedule was given to each respondent. The distribution of the total sample as used for the abbreviated list is shown in table 1, the distribution of the parts in table 13. Table 15 reveals in which part of the schedule specific food items were listed.

DEGREE OF PREFERENCE OF THE TWO POPULATION
GROUPS FOR VARIOUS FOOD ITEMS AND FOOD
GROUPS

The information presented in table 14 is based on replies from 1,311 respondents regarding the abbreviated list. Table 14 shows the percentage of people in each of the categories of preference and the combined percentages who failed to give the information or who indicated an allergy. Since allergies were rarely mentioned, these percentages refer mainly to the group for whom no information was obtained.

Attempting to evaluate degree of food preference is difficult because of the highly subjective nature of attitudes toward food. The response of the same individual may vary with conditions at the time of the interview. Certain responses, as "very good," and "disliked" represent extremes of attitudes, which may be relatively more fixed than attitudes represented by "good" or "moderately well liked." It is felt, therefore, that the extreme responses may be of greater significance than intermediary statements of preference in determining differences among groups of people with respect to their food preferences.

APPETITE LEVELS FOR CERTAIN FOOD GROUPS AND MAJOR
FOOD ITEMS

FOODS REGARDED AS VERY GOOD

No food, or group of foods, was considered very good by as many as three-fourths of the two population groups of Iowa. (See table 14.) Butter was the food for which the largest proportion of people expressed the highest degree of preference. Next in order were beef steak, potatoes, beef roast, fruit, citrus fruits and tomatoes, pastry, eggs and pork chops. Each of these foods was considered very good by more than half of the people represented in the study.

Foods which one-half to one-fourth of the people regarded as very good were leafy green vegetables, the green and yellow, and vegetables as a class; roast pork, milk, ground beef, breadstuffs, cheese, confections, fish, nuts, beef stew and cereals, in the order listed. Foods highly popular with less than one-fourth of the people were lamb of all types studied and organ meats, especially tongue, heart and kidney. Food accessories as soft drinks, alcoholic beverages, relishes, flavorings, spices and herbs were regarded as very good by less than one-fourth of the people.

TABLE 14. DEGREES OF PREFERENCE FOR VARIOUS FOOD ITEMS AND GROUPS AS EXPRESSED BY TWO POPULATION GROUPS OF IOWA.*

	Very good	Good	Moderate	Tolerated	Disliked	Not tried	No inf. or allergic
	%	%	%	%	%	%	%
Milk.....	46	22	14	5	8	0	5
Cheese.....	43	33	16	3	2	0	3
Butter.....	71	17	7	1	1	0	3
Beef.....	32	15	7	1	1	0	44**
Beef steak.....	64	24	7	1	1	1	2
Beef, roast.....	59	25	5	1	1	0	9
Beef, ground.....	45	35	12	2	3	0	3
Beef, stew.....	31	34	16	3	7	1	8
Pork chops.....	51	28	9	2	4	1	5
Pork roast.....	46	29	13	3	5	1	3
Pork.....	25	15	4	1	2	1	52**
Lamb chops.....	8	8	7	4	42	22	9
Lamb, roast.....	7	7	6	3	43	25	9
Lamb.....	6	7	4	2	36	17	28**
Liver.....	24	27	13	5	21	6	4
Tongue.....	9	17	11	4	35	17	7
Heart.....	9	19	13	4	30	15	10
Kidney.....	2	3	2	1	39	41	12
Fish.....	33	30	17	4	8	1	7
Eggs.....	56	24	13	2	1	0	4
Nuts.....	33	30	14	3	10	1	9
Vegetables.....	48	20	7	1	1	0	23
Potatoes.....	62	18	15	1	1	0	3
Green and yellow vegetables.....	49	28	15	2	2	0	4
Leafy green vegetables.....	50	30	13	3	2	0	2
Fruits.....	58	25	8	1	1	0	7
Citrus fruits and tomatoes.....	56	27	10	2	1	1	3
Cereals, prepared.....	26	30	15	5	12	1	11
Cereals, uncooked.....	24	25	21	6	16	1	7
Breads.....	45	31	11	1	2	1	9
Breads, hot.....	40	33	12	2	5	1	7
Pastry.....	56	25	13	1	2	1	2
Confections.....	36	25	22	3	8	1	5
Soft drinks.....	18	27	24	6	17	2	6
Alcoholic beverages.....	5	10	14	3	39	19	10
Relishes.....	23	28	28	5	7	1	8
Flavorings.....	15	37	34	2	4	1	7
Spices.....	11	22	38	6	12	2	9
Herbs.....	4	13	28	6	18	22	9

*Percentages were based on weighted figures.

**There was a disproportionately large percentage in the "no information" column because of interviewers' misinterpretation of instructions.

The people of the open country seemed to have a greater zest for the foods listed than had people in rural or urban places. Proportionately more of this group than of the other groups indicated the highest degree of preferences for the largest number of items. The people of the open country more consistently than others described meats and cereals as very good, and less consistently referred to vegetables in this manner. The relationship of age to degree of preference varied with sex and place of residence. In the open country more of the older men than of the younger

men described the foods mentioned as very good; in the urban and rural places more of the younger men registered the highest degree of enthusiasm for the foods listed. Regardless of residence, older women were more likely than younger women to consider the foods listed as very good.

FOODS DISLIKED

The attitude of disliking the foods varied in frequency from approximately one-half, who disliked lamb either as chops or roast, to less than 1 percent for a large number of the items. Next to lamb, the organ meats were disliked by the largest proportion of respondents. Liver, disliked by about one-fourth of the people, was less frequently disliked than heart, tongue or kidney. Spices and herbs were disliked by approximately one-eighth to one-fifth of the people. Alcoholic beverages were disliked by more than one-third and soft drinks by about one-fifth. (See table 14.)

Fewer of the people of the open country than of urban and rural places registered dislikes for the various food items. Dislikes were more prevalent among the older than the younger men, but among the younger than the older women. No consistent difference in this respect was noted between the men and women as a whole.

FOODS NOT TRIED

Foods most frequently listed as "not tried" were lamb, organ meats and herbs. Of the organ meats, 42 percent of the people had not tried kidney while 17 percent had not tried tongue, 15 percent heart, and 6 percent liver. Generally, the foods which rated high in dislikes were those which also had not been tried by relatively large portions of the people. Familiarity with foods and frequency of use may be important factors in determining preferences.

A study of the foods "not tried" by place of residence, sex and age, revealed that more of the people in the open country than elsewhere had not tried such foods and substances as kidney, lamb, herbs and alcoholic beverages. In most instances more of the younger than of the older people had failed to try the foods. No conspicuous difference between the sexes existed in this respect. A larger proportion of women than of men had not tried the foods.

A high degree of preference does not seem to exist for some of the nutritionally most important foods such as milk, vegetables and liver. The large difference between the appetite level for butter and for milk indicates an obstacle in promoting the use of fluid milk at the expense of butter production. The fact that three-fourths of the people consider butter very good and less than one-half consider

milk in this category no doubt contributes to the prevailing practice of converting much of the milk to butter.

Foods shown in parts I and II of this bulletin to be used in greatest frequency by the Iowa people were generally those for which a high degree of preference exists, such as meat and potatoes. The frequencies of use of some foods in the daily menus were strikingly similar to the frequencies for which these foods were rated as very good. Examples are as follows:

	Percentages of respondents using food in specified meal		Percentage rating food as very good*
	Noon Meal	Evening Meal	
Meat	73	71	64 (steak)
Potatoes	57	61	62
Gr. & Y. Vegetables	29	23	49
Other Vegetables	32	32	48 (class)
Milk	28	28	46

*cf. table 14.

Breads presented a striking exception. Though regarded as very good by a fairly small proportion of the people they were generally used. Cheese, on the other hand, was regarded as very good by 42 percent of the people, but appeared on the menus of only approximately 10 percent.

Among the meats certain differences were apparent. Beef was preferred to pork, and pork to lamb. With beef, steak was the cut best liked by most of the people, with roast next, and with ground beef and stew decreasingly preferred. Fish was less popular than either beef or pork, but was much more frequently preferred than lamb or organ meats.

APPETITE LEVELS FOR SPECIFIC FOOD ITEMS

VEGETABLES

A wide range of attitudes toward vegetables is at once apparent. The most highly favored by the subsample respondents as a whole were sweet corn and white potatoes. While almost three-fourths of the people considered these vegetables very good, less than one-fourth rated cauliflower, peas in pod, peppers, turnips, eggplant, turnip greens, broccoli and lentils in this category. A consideration of the total list of vegetables reveals that only about one-third were considered as very good by as many as half of the people. Vegetables as a class, it will be remembered, were considered very good by about one-half of the total group.

The two most highly preferred vegetables are mild in flavor. Inspection of the table suggests that the strong

TABLE 15. DEGREE OF PREFERENCE FOR FOOD ITEMS.*

	Part of schedule	Very good (Pct.)	Good (Pct.)	Medium (Pct.)	Tolerate (Pct.)	Dislike, etc.** (Pct.)
Vegetables						
Corn, sweet.....	I	72	24	4	0	0
Potatoes, white.....	II	70	18	11	0	1
Lettuce.....	II	58	26	12	1	3
Tomatoes.....	III	58	20	18	0	4
Peas, shelled.....	II	55	23	8	1	13
Cabbage.....	I	51	36	8	3	2
Celery.....	I	50	30	10	2	8
Onions.....	II	49	28	12	2	9
Potatoes, sweet.....	II	46	25	16	2	11
Beans, pod.....	I	44	30	12	2	12
Carrots.....	I	42	30	16	3	9
Beans, shelled.....	I	40	34	18	3	5
Cucumbers.....	I	33	37	16	2	12
Sauerkraut.....	III	31	31	14	7	17
Squash.....	III	30	26	19	6	19
Spinach.....	III	28	17	15	5	35
Cauliflower.....	I	21	30	13	3	33
Peas in pod.....	II	20	19	6	1	54
Peppers.....	II	17	26	16	7	34
Turnips.....	III	16	22	19	4	39
Eggplant.....	I	12	19	8	1	60
Turnip greens.....	III	5	9	6	2	78
Broccoli.....	I	5	8	8	4	75
Lentils.....	II	3	3	3	1	90
Fruits						
Strawberries.....	I	71	22	4	1	2
Peaches.....	I	65	28	6	0	1
Bananas.....	IV	59	26	8	3	4
Oranges.....	I	58	28	9	2	3
Apples (ck.).....	IV	52	25	12	2	9
Apples (dessert).....	IV	48	21	12	4	15
Grapefruit.....	IV	47	27	8	3	15
Apricots.....	IV	33	27	22	3	15
Grapes.....	IV	32	34	16	2	16
Raisins.....	I	31	42	16	2	9
Prunes.....	I	25	39	23	5	8
Dates.....	IV	23	32	22	3	20
Plums.....	I	16	34	31	5	14
Figs.....	IV	9	17	17	10	47
Avocado.....	IV	3	4	4	1	88
Poultry and Game						
Chickens, fryers.....	II	81	14	3	1	1
Chicken, roast.....	II	66	17	9	1	7
Turkey.....	III	45	23	16	3	13
Game.....	III	17	11	3	0	69
Cereals						
Bread, wheat.....	I	41	31	13	4	11
Spaghetti.....	II	35	29	16	5	15
Cornbread.....	I	28	28	21	2	21
Macaroni.....	I	24	25	14	5	32
Bread, potato.....	I	19	31	17	3	30
Rice cereals.....	IV	18	19	9	5	49
Corn cereals.....	IV	16	22	12	7	43
Bread, rye.....	I	17	28	19	3	33
Bread, other wh.....	I	16	13	3	0	68
Wheat cereals.....	IV	14	24	12	4	46
Grits.....	IV	11	13	11	5	60
Oat cereals.....	IV	9	14	9	5	63
Desserts						
Ice cream.....	IV	63	18	14	0	5
Pies.....	I	55	31	6	3	5
Cakes.....	I	45	28	14	5	8
Cookies.....	I	41	31	17	5	6
Candy bars.....	IV	36	25	16	2	21
Pudding.....	I	27	41	19	3	10
Miscellaneous						
Peanuts.....	III	36	30	4	3	27
Pecans.....	III	30	28	8	2	32
Pickles.....	I	10	9	5	0	76
Margarine.....	I	1	5	4	2	88

*Percentages are based on weighted figures.

**Group includes items disliked, not tried, those for which there is no information and those to which subjects were allergic.

flavored vegetables are among the less popular. An interesting contrast exists in the responses to white and sweet potatoes; white potatoes were considered very good by 70 percent and sweet potatoes by 46 percent of the people:

FRUITS

The range of preference of fruits was similar to that of vegetables, though perhaps on the whole slightly higher. Strawberries were the most highly favored fruit with peaches, bananas, oranges and apples next. Least often rated as very good were avocados, figs, plums, dates and prunes. Except for bananas, the nonacid fruits were not highly preferred. Extreme acidity, however, may detract from the appetite levels as judged by the fact that plums were not considered very good by many of the respondents and that grapefruit was relatively less frequently rated very good than were oranges.

POULTRY AND GAME

Information regarding poultry and game was obtained from only a portion of the respondents. Chicken fryers seemed to be not only the favorite among this class of foods but the most highly favored of all meats. Roast chicken was less popular than fried, and turkey less popular than chicken in any form studied. Game, which had not been tried by a fairly large proportion, was considered very good by only 17 percent of the subsample respondents.

CEREALS AND BREADS

The appetite level for specific types of cereals and breads was apparently about the same as that for cereals and breads as a group. In general it ranked below both fruits and vegetables, if proportion of group considering the food "very good" may be taken as an index. Combining this information with that obtained in the previous section, it seems that breads are more popular than cereals in other forms, that prepared cereals are more popular than those which must be cooked. In spite of the high production of corn in the state, cornbread, corn cereals and grits were not considered very good by many of the people. In this state there seems to be no decided preference among corn, wheat or rice cereals. Though oatmeal was observed to be one of the most frequently used breakfast cereals, it was least often rated as very good. Spaghetti was more frequently rated good than macaroni.

DESSERTS

Of the desserts, ice cream was most frequently and puddings least frequently rated as very good. Pies, cakes, cookies and candy bars in the order listed were considered very good by one-half to one-third of the people.

SUGGESTED RELATIONSHIP OF PREFERENCES TO NATIONALITY
ORIGIN OF MOTHER

While the Iowa population is predominantly "Old-American," it does contain a fair-sized group of people whose backgrounds are considered predominantly foreign. The three groups most largely represented are the people from the British Isles, Scandinavian countries, and Central and Western Europe. The British Isles classification includes Northern Ireland, Eire, Scotland, England and Wales. The Scandinavian countries include Denmark, Norway, Sweden, Iceland and Finland. Central and Western European countries consist of Switzerland, France, Germany, Netherlands, Austria, Belgium and Czechoslovakia. This is the classification used by the Food and Agriculture Organization in its analysis of the world food supply. The number of respondents whose mothers were of these nationality origins is shown in table 13.

While the respondents themselves may have been two generations removed from the ancestor who came from the "old country," some said that the influence of their origin was still felt in their food habits. The persistence of these nationality customs may be more evident in Iowa than in some other parts of the country, since many of the immigrants settled in small rural communities. It was thus possible for them to continue their traditional manner to an extent greater than those who settled in large urban centers. A study of the food habits of the people of foreign descent in this state may be of special interest, therefore, in the problem of obtaining a better understanding of factors influencing food habits. This study was not designed to detect differences among nationality groups, but an analysis was made of these differences as they were noted in the sample of Iowans chosen.

A comparison of the appetite levels of the four nationality groups may be made from table 16 which presents the percentages of respondents in each group who considered the food items mentioned as very good (based on weighted sample totals).

White potatoes were generally a top ranking vegetable, but their popularity was exceeded by that of corn for the

people of British Isles descent, and by tomatoes for those of Central and Western Europe. The vegetables which few of the respondents regarded as very good were about the same for each nationality group. This list included turnips, as roots or greens, peppers, eggplant, broccoli and lentils. An exception was cauliflower, which was considered very good by a fair proportion of people of British Isles and Scandinavian origin, but was thus rated by only a few of those from Central and Western Europe.

Vegetables which were rated as very good by higher proportions of people from the British Isles than from the other foreign groups were sweet corn, cucumbers, spinach, eggplant and turnip greens. Those which were rated as very good by more of the Scandinavians were white potatoes, carrots, shelled peas, celery, beans in pod, sweet potatoes, shelled beans, squash, peas in pod and cauliflower. Responses of "very good" from the Central and Western European stock were more frequent, proportionately, than those of the other foreign groups, for tomatoes, sauerkraut and turnips. The attitudes of Scandinavians obviously differed from those of the people of the United States origin more than did those of British Isles or of Central and Western European descent, both of which were highly correlated with those of United States origin.

A similar analysis of the data on fruits revealed strawberries to be the favorite regardless of nationality. As with vegetables, the Scandinavians seemed to have a higher degree of liking for more of the fruits than had either of the other two groups indicating recent foreign descent. The percentages were higher for these people than for the other groups in 9 of the 16 fruits listed. Fruits which were highly preferred by more of the people of Central and Western Europe than of the others were grapes, apples, raisins and dates. There were no fruits for which the percentages of respondents from the British Isles actually exceeded corresponding percentages in the other groups. Again, attitudes of the Scandinavians were more divergent than others from the attitudes expressed by people who listed the United States as the predominating nationality of mother.

More of the Scandinavians than of the other foreign groups regarded the food items of the meat group as very good. Most similar to the attitudes expressed toward items of the meat group by people of U. S. origin were those expressed by people of Central and Western European descent. Those of British Isles descent, though similar, were slightly more dispersed, and those of the Scandinavians were considerably more dispersed. The divergence in attitudes

TABLE 16. PERCENTAGES OF RESPONDENTS RATING FOOD AS VERY GOOD.*

United States	Pct.	British Isles	Pct.	Scandinavian	Pct.	Central and Western Europe	Pct.
Vegetables							
Potatoes, white...	74	Corn, sweet....	79	Potatoes, white...	78		
Tomatoes.....	74			Carrots.....	74		
Lettuce.....	71						
Peas, shelled....	61	Potatoes, white...	67	Peas, shelled....	66	Tomatoes.....	69
Celery.....	61	Tomatoes.....	65	Corn, sweet....	62	Corn, sweet....	67
				Celery.....	62	Potatoes, white...	63
				Beans, pod....	60		
Corn, sweet.....	57	Peas, shelled....	54	Potatoes, sweet...	55	Lettuce.....	54
Potatoes, sweet...	56	Lettuce.....	52	Beans, shelled...	54	Cabbage.....	50
				Cabbage.....	52		
				Tomatoes.....	52		
Beans, shelled....	48	Celery.....	49	Onions.....	47	Celery.....	49
Carrots.....	43	Potatoes, sweet...	47			Peas, shelled....	49
Cabbage.....	40	Onions.....	42			Onions.....	47
		Cabbage.....	40			Beans, pod....	43
						Potatoes, sweet...	40
						Carrots.....	40
Cucumbers.....	39	Cucumbers.....	38	Squash.....	36	Beans, shelled....	36
Sauerkraut.....	35	Carrots.....	34	Peas, pod....	35	Sauerkraut.....	34
Spinach.....	34	Beans, pod....	32	Lettuce.....	35		
Beans, pod....	33	Spinach.....	30	Cauliflower.....	33		
Squash.....	31						
Onions.....	24	Squash.....	29	Cucumbers.....	22	Squash.....	28
Cauliflower.....	22	Beans, shelled...	27	Sauerkraut.....	21	Cucumbers.....	27
		Cauliflower.....	26			Spinach.....	25
		Sauerkraut.....	25			Peas, pod....	23
Peppers.....	17	Turnips.....	15	Peppers.....	11	Turnips.....	18
Turnips.....	14	Peppers.....	14			Peppers.....	15
Peas, pod....	17	Peas, pod....	13			Cauliflower.....	17
Eggplant.....	10	Eggplant.....	12				
Turnip greens...	5	Turnip greens...	9	Spinach.....	9	Eggplant.....	9
Broccoli.....	3	Broccoli.....	6	Turnips.....	7	Lentils.....	6
Lentils.....	0	Lentils.....	2	Broccoli.....	5	Broccoli.....	5
				Eggplant.....	0	Turnip greens...	2
				Turnip greens...	0		
				Lentils.....	0		
Fruits							
				Strawberries....	94		
				Peaches.....	82		
Strawberries.....	73	Strawberries....	74	Pears.....	79		
Peaches.....	69	Peaches.....	65	Oranges.....	69	Strawberries.....	66
Bananas.....	55			Grapefruit.....	66	Bananas.....	60
Oranges.....	60						
Pears.....	52	Bananas.....	59	Apples, cooked..	54	Peaches.....	59
		Apples, cooked..	53	Plums.....	50	Apples, dried....	52
		Grapefruit.....	53			Oranges.....	51
		Pears.....	53			Apples, cooked....	50
Apples, cooked...	48	Apples, dried... 49		Apples, dried... 49		Pears.....	44
Apples, dried....	48			Bananas.....	46	Grapefruit.....	42
				Prunes.....	44		
				Apricots.....	40		

*Percentages are based on weighted sample totals.

**There was a disproportionately large percentage in the "no information" column because of interviewers' misinterpretation of instructions.

TABLE 16. (Continued.)

United States	Pct.	British Isles	Pct.	Scandinavian	Pct.	Central and Western Europe	Pct.
Fruits—continued							
Apricots.....	36	Oranges.....	39	Raisins.....	32	Apricots.....	36
Grapefruit.....	34					Raisins.....	36
Grapes.....	34					Grapes.....	35
Raisins.....	32	Grapes.....	29	Grapes.....	23	Prunes.....	25
		Apricots.....	27			Dates.....	24
Prunes.....	24	Raisins.....	23				
		Prunes.....	21				
Figs.....	19	Plums.....	11			Plums.....	12
Plums.....	17						
Avocados.....	2	Figs.....	8			Figs.....	8
		Avocados.....	8	Avocados.....	0	Avocados.....	2
Dates.....	0	Dates.....	0	Dates.....	0		
				Figs.....	0		
Meat							
Chicken, fryers...	72	Chicken, fryers...	82	Chicken, fryers...	84	Chicken, fryers....	79
				Chicken, roast...	73		
Chicken, roast...	67	Chicken, roast...	63	Steak.....	71	Steak.....	67
Roast beef.....	67	Steak.....	60	Turkey.....	63	Chicken, roast....	64
Steak.....	63					Roast beef.....	60
Eggs.....	58			Pork chops.....	59		
Roast pork.....	55			Roast beef.....	57		
Milk.....	55			Eggs.....	56		
Pork chops.....	53			Roast pork.....	55		
Turkey.....	54			Ground beef.....	55		
American cheese...	52	Eggs.....	55			Eggs.....	57
Cottage cheese...	51	Cottage cheese...	52				
Ground beef.....	50	Roast beef.....	50				
		American cheese	48	Milk.....	45	Turkey.....	47
		Roast pork.....	43	American cheese	45	Milk.....	44
		Pork chops.....	43	Stew.....	41	Pork chops.....	44
		Ground beef.....	42	Beef**.....	41	Roast pork.....	43
		Milk.....	40			American cheese...	43
Beef**.....	36	Beef**.....	33	Pork**.....	35	Ground beef.....	42
Stew.....	36	Stew.....	31			Cottage cheese....	37
Liver.....	30	Turkey.....	37				
Game.....	30						
Pork.....	28	Pork**.....	27	Cottage cheese..	24	Beef**.....	29
		Liver.....	22			Stew.....	27
						Liver.....	24
						Pork**.....	21
Heart.....	18	Game.....	13	Game.....	14	Heart.....	13
		Roast lamb.....	10	Liver.....	13	Game.....	15
		Lamb chops....	10				
Lamb chops.....	7	Heart.....	9	Lamb**.....	9	Lamb chops.....	8
Roast lamb.....	6	Lamb**.....	8	Lamb chops....	8	Roast lamb.....	5
Lamb**.....	4			Heart.....	6	Lamb**.....	5
				Roast lamb.....	3		
Cereals							
Wheat bread....	48			Wheat bread....	51		

*Percentages are based on weighted sample totals.

**There was a disproportionately large percentage in the "no information" column because of interviewers' misinterpretation of instructions.

TABLE 16. (Continued.)

United States	Pct.	British Isles	Pct.	Scandinavian	Pct.	Central and Western Europe	Pct.
Cereals—continued							
Cornbread	39			Rye bread.....	36		
Spaghetti.....	36			Macaroni.....	35	Spaghetti.....	36
Macaroni.....	32	Wheat bread....	39	Spaghetti.....	31	Wheat bread.....	36
Potato bread.....	29	Cornbread	23			Cornbread	24
Rice cereal.....	24	Spaghetti.....	22	Cornbread	20	Macaroni.....	22
		Other wh. bread	20				
Rye bread.....	17	Macaroni.....	16	Corn cereal.....	14	Corn cereal.....	19
Mush and grits...	16	Rice cereal.....	16	Oat cereal.....	14	Other wheat bread	19
Wheat cereal.....	15	Potato bread....	15	Rice cereal.....	12	Potato bread.....	18
Corn cereal.....	14	Corn cereal.....	13	Wheat cereal....	11	Rice cereal.....	17
Other wheat bread	11	Wheat cereal....	11	Mush and grits .	11	Wheat cereal....	15
						Rye bread.....	13
						Oat cereal.....	11
Oat cereal.....	6	Rye bread.....	9	Potato bread....	9		
		Oat cereal.....	8	Other wh. bread	7	Mush and grits....	8
		Mush and grits .	7				
Desserts							
Ice cream.....	78			Cookies.....	85		
				Ice cream.....	71		
				Pies.....	62		
Pastry.....	56	Ice cream.....	59	Cake.....	59	Ice cream.....	56
Cake.....	55			Pastry.....	58	Pies.....	55
Pies.....	52						
Cookies.....	46	Pastry.....	47				
Candy bars.....	40	Pies.....	47				
		Cake.....	43				
		Candy bars.....	33	Puddings.....	37	Pastry.....	36
		Cookies.....	32	Candy bars.....	33	Candy bars.....	35
						Cake.....	34
						Cookies.....	31
Puddings.....	29	Puddings.....	24			Puddings.....	25
Miscellaneous							
Butter.....	84	Butter.....	70				
				Butter.....	61	Butter.....	68
				Pecans.....	53		
Peanuts.....	48			Pickles.....	47		
				Peanuts.....	45		
Pecans.....	38	Pickles.....	35			Peanuts.....	33
Pickles.....	38					Pickles.....	32
		Pecans.....	23			Pecans.....	27
		Peanuts.....	22				
		Relish.....	13				
Herbs.....	9	Margarine.....	6	Margarine.....	17	Relish.....	9
Relish.....	8	Herbs.....	4	Relish.....	3	Margarine.....	2
Margarine.....	3			Herbs.....	4	Herbs.....	2

*Percentages are based on weighted sample totals.

**There was a disproportionately large percentage in the "no information" column because of interviewers' misinterpretation of instructions.

toward turkey is interesting. More Scandinavians but fewer of the people of the British Isles than of the so-called U. S. stock tended to rate it as very good.

When the Scandinavian group is compared with the Central and Western European group, the frequencies of very good ratings for the Scandinavians were 23 percent higher for rye bread, 15 percent higher for whole wheat, and 13 percent higher for macaroni; whereas the only items for which the Central and Western Europeans had decidedly higher preferences were potato bread and other white bread. Cereal preferences of the descendants of the British Isles resembled Scandinavians in some respects and Central and Western Europeans in others, and often took intermediate positions.

Scandinavians seemed to have decidedly greater likings than the other foreign groups for all desserts except puddings, where the attitudes were about the same. The most striking difference was for cookies which Scandinavians rated first and the other groups rated nearly lowest.

This study of food preferences in relation to nationality of the mother is somewhat incidental to the main purpose of the investigation. It indicates, however, that differences in attitudes toward foods are apparent among those with different cultural backgrounds, and that these influences may persist for generations. Of the groups studied, the Scandinavians appeared to have a higher degree of interest in many foods than the other groups. Food preferences of the Scandinavians seemed to vary more from the so-called U. S. pattern than those of Central and Western Europe or of the British Isles.

ANALYSIS OF ATTITUDES TOWARD FOODS WHICH HAD BEEN TRIED AND FOUND ACCEPTABLE

The foregoing data were based on total number of the schedules presented for each item. Some foods had not been tried by fairly large portions of respondents and others were disliked. Differences between appetite levels of groups included within the sample might appear different if the analysis were based only on foods known and considered acceptable to some degree. From the standpoint of gaining a better understanding of the acceptability of food, it may be as important to have computations on those who have tried and found the food acceptable as on the total number of people. (See table 17.) Figures 12, 13 and 14 show graphic comparisons according to age, sex and place of residence. Figures on abscissae and ordinates are percentages of respondents. Each dot represents a food item; the

TABLE 17. PERCENTAGE FREQUENCY OF RESPONSE OF VERY GOOD TO FOODS TRIED AND CONSIDERED ACCEPTABLE.

			Age		Sex		Place of residence		
	No.*	Pct.**	17-19 yrs.	46-58 yrs.	Male	Female	Open country	Rural places	Urban places
			Pct.†	Pct.†	Pct.†	Pct.†	Pct.†	Pct.†	Pct.†
Vegetables									
Beans, pod.....	323	89	50	50	46	54	48	39	58
Beans, shelled.....	344	94	44	42	41	44	45	38	42
Broccoli.....	94	26	18	19	11	27	18	16	21
Cabbage.....	355	97	30	61	52	53	49	40	60
Carrots.....	330	90	36	50	35	55	40	42	52
Cauliflower.....	245	87	28	33	21	41	23	32	38
Celery.....	336	92	53	55	50	59	47	47	63
Corn, sweet.....	364	100	74	70	72	71	70	67	74
Cucumbers.....	318	87	39	38	35	39	32	27	49
Eggplant.....	145	40	16	32	27	27	20	26	36
Lentils.....	30	10	67	11	0	43	60	0	9
Lettuce.....	295	96	42	65	55	64	51	62	65
Onions.....	279	91	39	58	53	55	45	52	62
Peas, pod.....	141	46	40	45	32	52	41	36	52
Peas, shelled.....	266	87	58	64	59	67	61	46	71
Peppers.....	207	67	22	26	17	32	32	34	19
Potatoes, sweet.....	272	89	33	57	52	52	49	44	58
Potatoes, white.....	302	98	75	70	74	69	76	66	69
Sauerkraut.....	265	83	21	40	35	39	39	35	36
Spinach.....	209	66	38	44	28	57	47	28	47
Squash.....	258	81	32	38	30	43	32	24	47
Tomatoes.....	308	97	62	59	64	75	68	40	70
Turnip greens.....	70	22	0	29	18	29	27	27	21
Turnips.....	196	62	15	27	14	36	20	29	28
Fruit									
Apples, cooked.....	291	91	61	56	61	53	59	58	54
Apples, dried.....	275	86	74	50	56	56	52	59	57
Apricots.....	271	84	31	41	40	38	42	43	34
Avocado.....	39	12	66	20	11	31	0	28	36
Banana.....	304	95	76	58	57	67	67	59	60
Dates.....	257	80	44	25	28	31	37	31	22
Figs.....	167	52	9	19	12	20	23	14	13
Grapefruit.....	272	85	63	53	49	62	53	50	60
Grapes.....	271	84	55	33	39	38	40	41	36
Oranges.....	354	97	69	57	62	59	61	52	64
Peaches.....	360	99	72	63	63	68	70	60	65
Pears.....	351	..	..	..	49	55	43	48	55
Plums.....	316	87	20	19	18	21	24	18	16
Prunes.....	334	92	18	31	23	31	29	23	27
Raisins.....	333	91	29	36	36	31	47	29	27
Strawberries.....	357	98	76	72	70	76	77	62	75
Meats, etc.									
Beef††.....	714	55	61	59	61	57	65	62	52
Beef, ground.....	1240	5	57	44	48	47	49	42	48
Beef, roast.....	1197	91	57	68	64	66	68	65	63
Beef, steak.....	1264	96	66	67	70	64	69	67	64
Chicken, fryers.....	302	98	82	82	78	85	82	85	79
Chicken, roast.....	284	93	59	75	71	72	67	69	76
Game.....	99	31	62	53	47	62	54	54	56
Heart.....	631	48	21	26	26	25	27	23	24
Lamb††.....	264	20	24	34	33	31	29	26	39
Lamb chops.....	355	27	20	33	29	32	32	33	29
Lamb roast.....	326	24	24	31	28	31	26	29	32
Liver.....	901	69	35	35	32	38	33	33	39
Pork††.....	586	45	63	54	57	54	61	49	54
Pork chops.....	1067	81	62	57	64	53	64	63	52
Stew.....	1112	85	31	39	37	40	37	33	39
Pork roast.....	1190	91	46	53	52	50	56	52	47
Turkey.....	276	87	56	52	51	54	58	57	47

*Sample number who know food and consider it acceptable (i.e. give it a preference rating of very good to tolerate).

**Percent of respondents asked in part of schedule in which item appeared.

†Based on weighted figures.

††There was a disproportionately large percentage in the "no information" column because of interviewers' misinterpretation of instructions.

TABLE 17. (Continued.)

			Age		Sex		Place of residence		
	No.*	Pct.**	17-19 yrs.	46-58 yrs.	Male	Female	Open country	Rural places	Urban places
			Pct.†	Pct.†	Pct.†	Pct.†	Pct.†	Pct.†	Pct.†
Cheese, American .	286	89	73	46	56	48	47	44	60
Cheese, cottage....	252	79	68	51	51	58	55	44	60
Eggs.....	1239	95	52	61	61	56	64	57	56
Milk.....	1150	88	66	48	54	51	52	53	52
Cereals									
Corn cereals.....	185	58	41	25	29	28	34	22	27
Cornbread.....	288	79	28	38	37	34	35	41	33
Grits.....	128	40	55	22	27	28	27	27	28
Macaroni.....	251	69	39	34	31	39	33	27	42
Oat cereal.....	120	37	38	23	40	33	39	23	13
Other wh. bread...	116	32	61	46	61	32	50	41	54
Potato bread.....	254	70	19	32	28	27	29	28	27
Rice cereal.....	164	51	55	27	36	34	42	28	33
Rye bread.....	245	67	23	25	22	26	25	25	23
Spaghetti.....	265	86	54	37	38	43	39	33	46
Wheat cereal.....	177	55	38	21	30	21	38	24	18
Wheat bread.....	328	90	43	48	49	43	47	47	46
Desserts									
Cakes.....	335	92	53	47	47	51	54	56	41
Candy bars.....	249	78	62	40	46	45	53	41	43
Cookies.....	341	93	55	39	38	50	52	48	35
Ice cream.....	308	96	85	61	67	65	70	62	65
Pastry.....	1244	95	63	58	61	56	59	60	58
Pies.....	343	94	65	55	61	54	62	60	54
Pudding.....	325	89	25	32	30	30	28	31	32
Miscellaneous									
Butter.....	1255	96	78	75	81	70	81	80	69
Herbs.....	681	52	6	23	18	23	20	27	18
Margarine.....	153	12	10	11	7	14	5	12	12
Peanuts.....	235	74	60	45	52	46	48	51	48
Pecans.....	215	67	58	41	39	50	44	40	47
Pickles.....	325	25	44	38	29	50	46	40	35
Relish.....	1104	84	12	24	17	24	18	27	20

*Sample number who know food and consider it acceptable (i.e. give it a preference rating of very good to tolerate).

**Percent of respondents asked in part of schedule in which item appeared.

†Based on weighted figures.

††There was a disproportionately large percentage in the "no information" column because of interviewers' misinterpretation of instructions.

distribution of dots above and below the diagonal line indicates the prevailing trends with respect to the two groups of people being compared. Dots placed above the line indicate that the degree of preference was greater for the group named on the ordinate; dots placed below the line indicate that the degree of preference was greater for the group named on the abscissa. It is thus possible to compare the attitudes of older and younger people, for example, to meats as a class, to vegetables, fruits, etc.

AGE IN RELATION TO DIFFERENCES IN ATTITUDES TOWARD ACCEPTABLE FOODS

Older people apparently have a higher degree of preference for vegetables they know and find acceptable than have

the younger people. For two-thirds of the 24 vegetables studied, more of the older than of the younger people responded with "very good." Attitudes toward vegetables of "moderately well liked" or only "tolerated" were much more frequent among the younger than among the older people. The differences between older and younger people were greatest for cabbage, turnip greens, sweet potatoes and lettuce. Concerning each of these about 25 percent more older than younger people responded "very good." (See fig. 12.) The one item on which proportionately many more younger people familiar with the item responded very good was lentils, but only a few people in either age group found lentils at all acceptable.

In contrast with vegetables, the degree of acceptance for fruits was apparently higher for younger than for older people. The fruits which more of the older than of the younger people rated as very good were apricots, figs, prunes and raisins, a group which may be generally characterized as dried and less acid. Subsequent studies of stated reactions to foods indicated that the acid flavor of fruits was frequently the basis of an unfavorable attitude toward them by older people. (See fig. 12.)

The avocado is suggested as an interesting fruit for further study. Of the relatively small number of people who knew it and regarded it as acceptable in any degree, a much larger percentage of younger than of older people called it very good.

Attitudes toward meats, known and regarded as acceptable, were not markedly different for the older and younger people. The greatest differences were in roast chicken, ground beef and lamb chops; ground beef was more highly favored by the younger people and roast chicken and lamb chops by the older.

Younger people were more enthusiastic about cereals than were the older people, as evidenced by the fact that in 8 of 12 opportunities to express preference, more of the former than of the latter responded with very good. The greatest differences in attitudes were expressed with grits and rice cereals. (See figure 12. Desserts are indicated by x, cereals by a dot.)

Proportionately more of the younger people than of the older group were highly interested in desserts. Puddings were the only dessert which more of the older than of the younger people considered very good. The greatest differences in attitude were for ice cream and candy bars, which were rated as very good by about one-fourth more of the younger than of the older people.

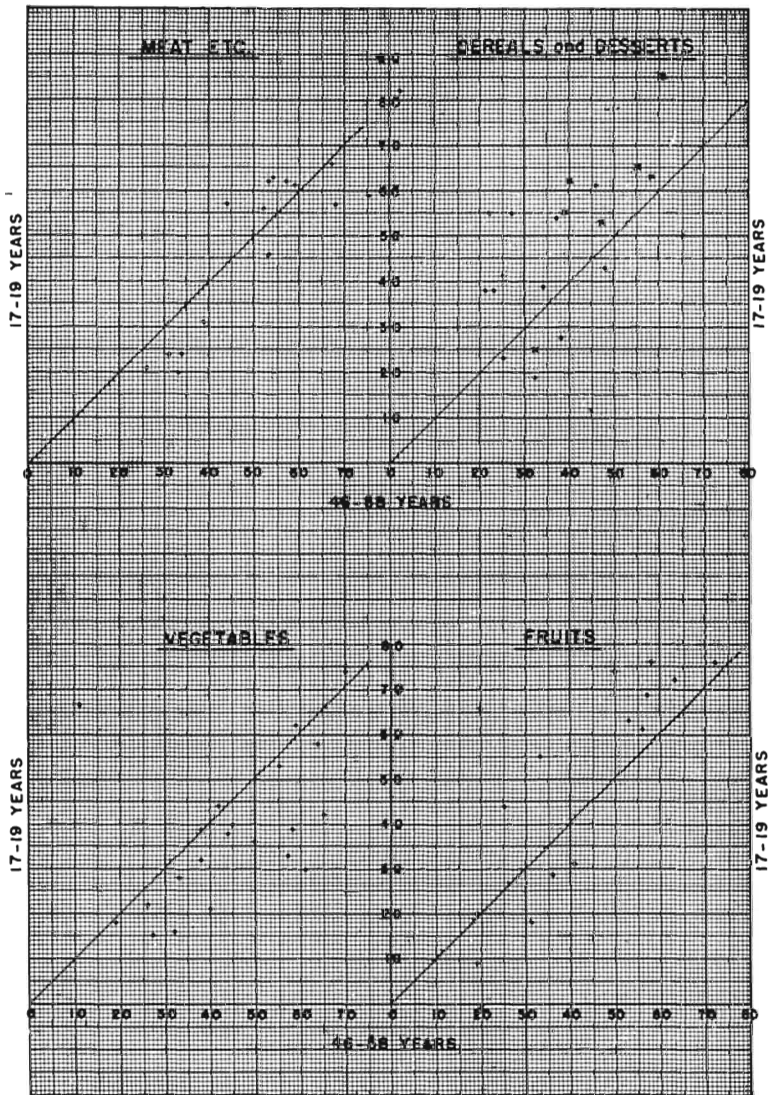


Fig. 12. Percentage frequency of response of "very good" to foods known and considered acceptable. Comparison based on age.

More of the younger people than of the older people indicated a high degree of preference for milk and both forms of cheese, while more of the older than of the younger people registered a high degree of preference for eggs.

A high rating for butter was given by about equal proportions of both age groups. The appetite level for nuts was higher for younger than older people. Pickles were rated very good by more of the younger than of the older people, but relishes scored the highest appetite rating with more of the older than of the younger people.

SEX IN RELATION TO DIFFERENCES IN ATTITUDES TOWARD ACCEPTABLE FOODS

Comparison of the sex groups on this same basis reveals some differences. (See fig. 13.) As with the age group, the greatest differences were apparent among the vegetables, which were rated as very good much more frequently by the women than the men. In 20 of 24 vegetables listed a larger proportion of women than of men gave the rating of very good. The differences were greatest for cauliflower, carrots, lentils, peas (pod), spinach and turnips. In general, for vegetables known and considered acceptable, more women than men have a high appetite level.

Similarly, but to a lesser extent, more of the women than of the men have a high degree of acceptance for fruits. The differences were greatest for avocado, grapefruit and bananas.

There were no pronounced differences between the sexes in the acceptance of meats. Milk, eggs and American cheese were regarded as very good by more of the men than of the women, but cottage cheese was rated as very good by more of the women than of the men.

Using the index here described, men more than women seem to have a high degree of acceptance for cereals. Differences with respect to desserts were not marked, but more of the women than of the men expressed a high degree of preference for cookies. More of the women than of the men favored herbs, margarine, pecans, pickles, relishes and other food accessories. Butter and peanuts were rated as very good by more men than women.

PLACE OF RESIDENCE IN RELATION TO DIFFERENCES IN ATTITUDES TOWARD ACCEPTABLE FOODS

Toward the foods which had been tried and were considered acceptable, a few differences in attitudes were observed to exist among the people who resided in open country, rural places and urban places. (See fig. 14.) Urban people appeared to have a higher appetite level for vegetables than people of the other two places of residence. In

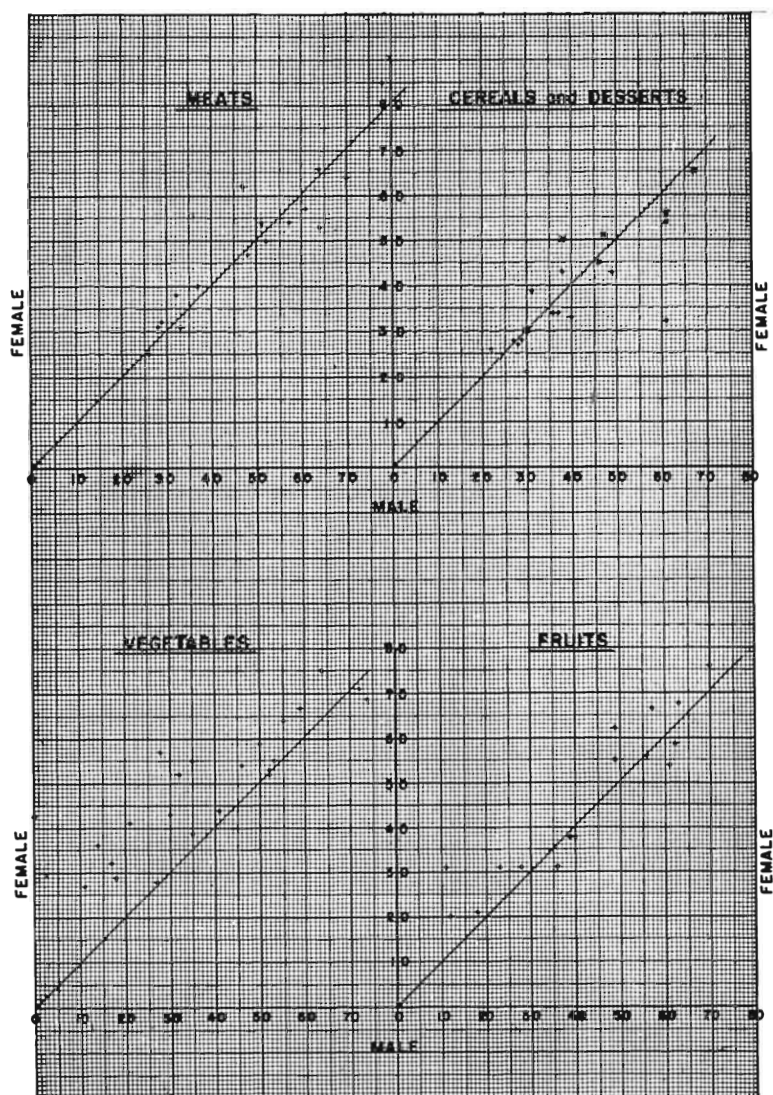


Fig. 13. Percentage frequency of response of "very good" to foods known and considered acceptable. Comparison based on sex.

16 of the 24 vegetables, more of the urban people than of the others responded "very good." Previous studies of the adequacy of the diets with reference to the use of green and yellow vegetables showed more of the urban people to have

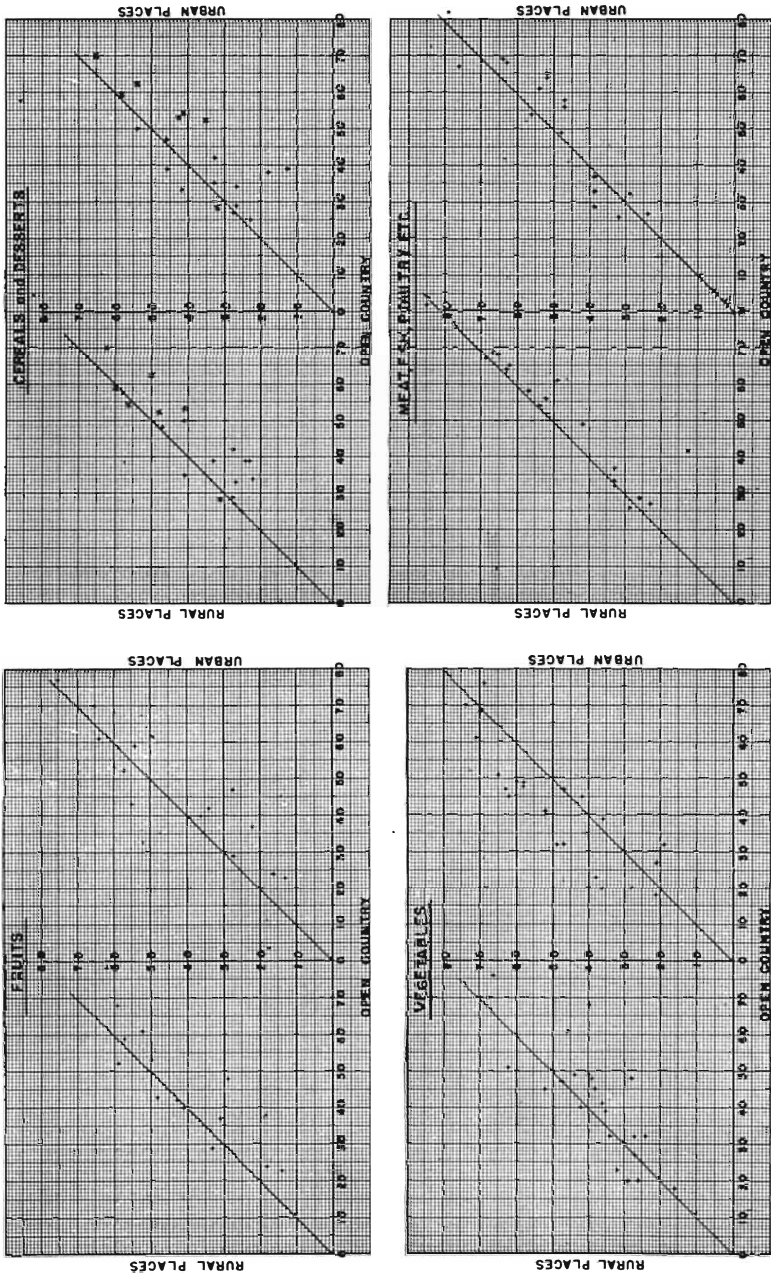


Fig. 14. Percentage frequency of response of "very good" to foods known and considered acceptable. Comparison based on place of residence.

attained a recommended standard in use of this group of foods.

Fruits which were known and accepted were rated very good by proportionately more people of the open country than by those of rural places and urban places. Meats likewise were considered very good by more people in open country than in rural and urban places. Cheese was highly favored by more urban people and eggs by more of those of the open country. No difference was noted in zest for milk in relation to place of residence. Enthusiasm for desserts seemed to be higher among the people in open country than elsewhere.

Based on the frequency of the response of "very good" to the entire list of foods, it appears that the people of the open country have a higher degree of acceptance of foods than people of rural or urban places. Considering these data in connection with those of the preceding section, it seems that zest for food is greatest among the people of the open country.

It is evident that age, sex, place of residence and nationality of parents influence attitudes toward foods. Acceptability is probably more varied for vegetables than any other group of foods. Some vegetables are liked very well by large proportions of the people; others liked very well by practically none. Differences in attitudes toward foods as here observed often conform to differences noted in the actual selection of food. Examples are the greater preference and use of milk by younger than older people, of green and yellow vegetables by urban people, and of fruits by women. The high degree of acceptance of meats, as beef, pork and poultry, by all groups was evident in the frequency of satisfactory diets in this respect regardless of group classifications. The greater frequency of a high degree of preference for many foods by people of the open country was accompanied by the greater frequency of diets satisfactory in several of the food groups, notably milk, meat, and other fruits and vegetables.

The analyses of data regarding degrees of preferences for various food items in the main corroborate previous conclusions that, in food selection, preferences and practices are closely related.

REASONS FOR LIKING AND DISLIKING FOODS

After being asked about their preferences for a given food, for amount usually eaten, and for most and least preferred forms, respondents were asked to state why they did or did not like that food.

TABLE 18. PERCENTAGE DISTRIBUTION OF FAVORABLE COMMENTS ON CERTAIN FOODS AND FOOD GROUPS.*

	Health	Flavor	Satis- fying; filling	Expense	Variety	Ease of prep.	Habit	Color and appear- ance	Texture	Special	Misc.	Sample no. of response	
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	F	U
Vegetables.....	35	29	12	3	7	1	1	4	1	0	7	227	35
Potatoes.....	17	21	37	2	0	1	9	0	5	0	8	311	49
Green and yellow vegetables.....	29	32	7	1	9	0	3	4	7	0	8	223	24
Leafy vegetables.....	34	22	6	1	0	0	1	7	21	0	2	269	46
Citrus fruits.....	32	32	3	0	1	0	1	13	6	0	12	279	57
Nuts.....	9	48	23	0	2	0	0	0	10	4	4	175	154
Milk.....	43	25	9	0	1	0	2	0	4	0	16	190	63
Cheese.....	15	53	9	0	1	0	2	0	4	0	10	207	77
Lamb.....	22	25	4	2	25	0	0	0	4	0	18	53	113
Lamb roast.....	14	42	4	0	20	0	0	0	0	0	20	50	69
Lamb chop.....	15	41	5	0	27	0	0	0	0	0	12	60	63
Breads.....	25	26	32	0	2	1	5	0	1	2	8	187	28
Hot breads.....	7	27	24	0	17	0	0	0	0	1	22	182	50
Pork.....	8	48	18	0	5	0	0	0	5	0	16	155	118
Pork chops.....	39	38	39	0	3	0	0	0	6	0	4	59	61
Pork roast.....	10	52	25	0	3	0	0	0	4	2	6	172	134
Fish.....	8	37	3	0	19	2	0	1	4	2	12	69	68
Heart.....	12	42	3	1	28	0	0	0	2	1	23	127	68
Tongue.....	6	37	1	1	30	0	0	0	9	0	21	91	57
Liver.....	1	36	1	1	15	0	0	0	1	0	7	171	52
Beef.....	54	21	2	0	11	1	0	0	1	0	11	94	11
Beef roast.....	36	31	16	0	1	1	0	0	4	0	17	248	43
Beef steak.....	16	40	16	0	1	3	1	0	6	0	18	240	82
Ground beef.....	13	47	10	0	1	0	0	0	11	0	17	218	28
Ground beef.....	11	33	15	5	5	5	0	2	7	0	17	218	28

F—Favorable

U—Unfavorable

*Percentages based on actual number of favorable responses, not weighted.

Many respondents did not comment on their attitudes. Of the comments, many more were favorable than unfavorable. The frequencies of both types of comments for the specific foods included in the abbreviated form are shown in table 18 together with the percentage distribution of the favorable responses.

The relatively small percentage of respondents who indicated reasons for their attitudes toward foods, or groups of foods, suggests general inability to analyze the attitudes or to give verbal expression to them. Reactions considered favorable by some were regarded as unfavorable by others. This was especially true for the flavor of sour or acid and for certain textural qualities, such as those applied to nuts.

Foods for which the greatest number of people made favorable comments were potatoes, citrus fruits, tomatoes, leafy green vegetables, fruit, roast beef, steak, vegetables and breads.

Those for which the greatest number of people made unfavorable comments were nuts, pork roast, pork chops and lamb. In the case of pork chops, a number of the unfavorable comments pertained to expense. More unfavorable than favorable comments were made about lamb, roast lamb, lamb chops, pork and kidney.

Some aspect of health was the basis of the largest proportion of favorable comments made for vegetables in general, leafy green vegetables, milk, liver, and beef as a class of food. Older people more than younger people were inclined to comment on the health aspects of food.

Flavor was the most frequent favorable comment for fish, heart, tongue, roast beef, beef steak, ground beef, green and yellow vegetables, nuts, cheese, lamb in all forms, hot breads and pork chops. Younger people more than older people emphasized flavor in their favorable comments.

Potatoes and pork rated highest among the foods studied for their satisfying and filling properties. Breads were second in this respect, then nuts and hot breads.

Foods regarded favorably because of the variety added to the diet through their uses were tongue, heart, lamb in all forms, fish, hot breads and liver. Foods rating high in this category generally ranked low in acceptability. In other words the foods used for variety's sake were not among the highly preferred; the term variety meat has more than one connotation.

Favorable comments in the remainder of the categories were very few. Ease of preparation, economy, color and appearance evidently are not appeals which are dominant in the minds of people, or which find ready expression. A

larger proportion of the respondents mentioned texture among their favorable comments than mentioned color and appearance. The foods which rated the most favorable comments on account of color and appearance were citrus fruits and tomatoes and leafy green vegetables. Foods which rated the most favorable comments on the basis of texture were leafy green vegetables, nuts and beef steak.

Health aspects of foods were variously indicated. With vegetables the following associations were mentioned: digestible, vitamins, energy, body regulation, laxative, stimulates appetite, and most frequently, "good for one." The green and yellow vegetables specifically were mentioned as being good for the eyes, complexion, blood and regulatory system and as aiding digestion, acting as a tonic and providing vitamins and iron.

The health aspects of citrus fruits were described in the following terms by different respondents: is laxative, is regulating food, is good in the morning, aids digestion, cleans out the stomach, freshens up the system, snaps up the appetite, alkalizes and provides minerals and vitamins, acts as a tonic, provides vitamin C, cuts body weight, strengthens, is good for the eyes, and helps bowel conditions.

Ideas about the healthfulness of milk were expressed as follows: could live a long time on it, builds bones, is easily digested, is a tonic, makes up for what you can't eat, is nature's food, is body building, good for digestion, is a necessary food, is an all around food, and is good for the complexion. Recognition was given to milk as a source of minerals, specifically calcium. Except among the younger men and women, vitamins were not mentioned in connection with milk.

Cheese was regarded as a food which takes the place of meat, is good for vitamins and minerals, provides energy and promotes endurance. Comments pertaining to health were about three times more frequent for milk than for cheese.

Of the meats studied, liver rated the largest number of comments concerning favorable effects on health. One-half of the people expressing reasons for favorable attitudes toward liver mentioned this quality. The health-giving qualities of liver were described as follows: provides iron, builds red blood, is good for the blood, furnishes more blood, improves red blood counts and provides vitamins.

Attitudes regarding the healthfulness of beef were as follows: gives strength, is easily and quickly digested, builds body tissue, is necessary to carry on body processes, builds up muscles and resistance, gives pep and helps one to work

better, gives energy, has lots of iron and food value, provides vitamins, and is essential.

Lamb was referred to as easy to digest, rich in food value, containing vitamins, and not giving a stuffy feeling. Ease of digestion was the predominating idea in the area of health with respect to this food.

Fish was regarded as healthful in that it contains iodine, makes healthy glands, is digestible, "sleeps good," makes strong nerves, and is a brain food. It was mentioned as a food containing vitamins.

Of the listed meats, pork, heart and tongue rated the fewest comments concerning their health-giving properties. Beef in general was the subject of favorable comments on health by 36 percent of the respondents while pork was mentioned in this respect by only 12 percent of the respondents making favorable comments about beef.

This analysis of the expressed attitudes of people toward the health-giving properties of foods suggests that there is a general lack of specific information. This aspect of the food is more frequently covered by the comment that the food is good for one than by any other expression.

The terms, vitamins and minerals, body builders, blood builders and energy givers, have found considerable acceptance. The apparent consciousness by people of ease or quickness of digestion is notable in the analysis of the comments. The differences in the attitudes of the public toward the healthfulness of such closely related foods as milk and cheese, beef and pork are of interest.

Unfavorable comments for most foods were much less frequent than favorable. They were also more difficult to classify and organize. For most foods the predominating reason for the unfavorable attitude pertained to flavor. Failure of the food to agree with the individual, the psychological associations with the food, mechanical difficulties in handling the food, odor, early unpleasant experiences with the food, and expense were the bases of most of the remaining adverse comments. The number and percentages of unfavorable comments distributed in the various classifications are given in table 18.

The adverse effects as expressed for selected groups of foods are listed below, generally in descending order of the frequency with which they were mentioned.

Vegetables	—Flavor distasteful; productive of physiological difficulties as heart burn, indigestion, gas, excessive laxation, sleeplessness, allergy.
Green and yellow vegetables	—Flavor distasteful; disagrees, produces gas, hard to digest, produces stuffy feeling; makes sleepy, roughage objectionable; odor while cooking unpleasant.

- Leafy green vegetables — Flavor distasteful; strong and tasteless; has a long after-taste; disagrees; produces gas, makes sleepy, has too much roughage. Psychological—tastes like grass; rabbit food.
- Potatoes — Too fattening (a predominating attitude with all groups but younger men).
- Citrus fruits and tomatoes — Flavor, particularly the acidity; physiological difficulties, gas formation, pimples; expense; objection to pulp.
- Milk — Flavor disliked; too sweet, tasteless, "animal-like," "cowy," unpleasant, disagreeable, flat. Physiological difficulties; gas formation, sours on stomach, sour after-taste, fattening, constipating, sickened on it in childhood. Expense (mentioned very occasionally).
- Cheese — Physiological difficulties (mentioned more frequently than objections to flavor); constipating (frequent comment), hard to digest, fattening, hurts stomach. Flavor; strong, rancid, sharp, greasy tasting, sour taste. Odor (relatively frequent as a cause of dislike). Expense (mentioned more frequently about cheese than milk).
- Nuts — Physiological difficulties; disagrees, indigestible, fattening, makes tongue smart, produces sore tongue, constipating, produces pimples, hard on teeth. Mechanical difficulties; hard to chew (particularly objectionable to older men and women with false teeth). Richness objectionable, and expense.
- Fish — Flavor and odor (most frequently mentioned); "tastes of mud"; "makes dishes unpleasant to wash." Mechanical difficulties; bones unpleasant to handle. Physiological effects; indigestible, nauseates, produces belching, makes thirsty, produces hives. Expense (considered expensive by a fairly large proportion of people).
- Beef — Expense (basis of most of unfavorable comments).
- Pork — Rich, fat, greasy (major objection to all forms of pork and by all groups of people). Physiological difficulties; disagrees, fattening, indigestible, and expense.
- Lamb — Flavor (the predominating unfavorable comment); woolly, muttoney, funny, nauseating. Odors, an "old smell," unpleasant when cooking. Psychological (associations with lamb interfere with desire to eat it). Availability and expense (minor basis for unfavorable reaction).
- Liver — Flavor (basis of most frequent objection, described as bitter, mild, strong). Psychological; "not fit for human consumption."

Heart	—Flavor and psychological (the chief basis for unfavorable comments).
Tongue	—Psychological and flavor (chief basis for unfavorable comments).
Kidney	—Psychological; "food for dogs."
Breads	—Fattening (most frequent objection).

Odor was listed among the unfavorable effects of several foods, but not among the favorable.

SOME IMPLICATIONS OF THE STUDY

OBSERVATIONS CONCERNING THE HEALTH OF THE PEOPLE

A part of the personal history sheet contained a check list of physiological conditions. Table 19 shows the frequency of the conditions for 1022 original respondents listed by age and sex. This information was not available for 29 of the respondents at the time this analysis was made.

The prevalence of these adverse conditions among the older group is striking, particularly when it is considered that this group was not old, but only middle-aged, and should be in the prime of life. Although reports were obtained for more women than men, these so-called ailments occurred more frequently with women than with men.

That the women may be in poorer physical condition than the men is indicated by the considerably more frequent occurrence of the following conditions: Anemia, arthritis, high blood pressure, tendency to bruise easily, chronic constipation, eyes over-sensitive to light, chronic fatigue, gall stones, goiter, headaches, mouth sores, muscle and joint pains, nervousness and irritability, neuritis, weakness and false teeth.

The ailments for which the men exceeded those of the women were broken bones, colds, ear trouble, hernia, peptic ulcers, pneumonia and rheumatism.

It is recognized that this information was not obtained by means of a medical examination at the time the dietary record was made, but it is significant that the people thought they were affected with so many ailments. The use of false teeth by at least 44 percent of the women and 33 percent of the men of this age group is of interest.

Among the younger people, the ailments most frequently reported were appendicitis, bruising easily, colds, and many

TABLE 19. FREQUENCY OF AILMENTS.

	Ages 48-56 yrs.		Ages 17-19 yrs.	
	422 Women	377 Men	129 Women	94 Men
	Sample no.	Sample no.	Sample no.	Sample no.
Allergy.....	46	20	8	8
Anemia.....	49	10	7	1
Angina pectoris.....	12	8	0	1
Appendicitis.....	51	45	13	6
Appetite, excessive.....	17	13	2	6
Appetite, lack.....	16	12	3	2
Arthritis.....	77	33	2	0
Asthma.....	18	18	2	4
Bleeding, tendency.....	5	4	0	1
Blood pressure, high.....	59	21	0	0
Blood pressure, low.....	48	19	1	0
Boils.....	14	22	4	10
Bones broken.....	25	46	6	10
Bruise easily.....	109	12	16	5
Cancer.....	3	0	0	0
Chest deformed.....	2	1	0	0
Colitis.....	2	3	0	0
Colds, chest, throat.....	76	83	33	19
Constipation, chronic.....	68	28	7	1
Diarrhea, chronic.....	6	3	0	0
Diabetes.....	4	3	0	1
Ear trouble.....	30	35	10	7
Eyes, inflamed, bloodshot, burning.....	24	15	5	2
Eyes, oversensitive to light.....	42	25	9	9
Eye lids, crusty, inflamed.....	2	3	2	0
Fatigue, chronic.....	68	42	4	2
Flat feet.....	1	0	0	0
Gall stones.....	49	8	0	0
Goiter.....	23	2	1	0
Gums, swollen, pyorrhea.....	23	20	5	2
Hair, dry, rough.....	24	13	6	2
Hay fever.....	14	13	8	2
Frequent headaches.....	77	42	20	6
Heart trouble.....	43	26	3	2
Hernia.....	11	36	3	3
Kidney trouble.....	2	3	0	0
Legs, bowed or knock-kneed.....	7	6	3	3
Lips, chapped, or peeling.....	7	2	7	4
Mental application, lack of.....	8	3	3	1
Menopause.....	6	..	..	..
Mouth sores.....	13	6	5	1
Muscle and joint pain.....	68	44	2	1
Muscles flabby.....	10	1	3	0
Nasolabial sebaceous plugs.....	8	12	4	0
Nervousness and irritability.....	121	58	16	8
Neuritis.....	29	15	1	0
Night blindness.....	20	9	0	0
Peptic ulcers.....	10	22	0	0
Piles.....	1	3	0	0
Pneumonia.....	28	43	8	8
Poor posture.....	7	5	4	2
Rheumatism.....	53	57	3	1
Sickness, never.....	4	5	2	5
Sickness, occasionally.....	74	57	35	8
Sickness, often.....	14	7	1	0
Sinus.....	7	6	4	1
Skin, wrinkling, goose pimples.....	6	0	3	2
Strength, lack or loss of.....	39	19	1	2
Tears, abnormal discharge of.....	20	7	0	0
Teeth, false.....	185	125	1	0
Teeth, nearly all still in.....	16	15	5	10
Teeth, many pulled decayed or filled.....	67	88	25	17
Throat, sore, red.....	16	6	3	2
Tumor.....	2	0	0	0
Tuberculosis.....	3	1	1	0
Varicose veins.....	4	0	0	0
Weight, recent excess gain.....	6	5	0	0
Weight, recent excess loss.....	10	1	1	1
Total number of respondents.....	422	377	129	94

teeth decayed and pulled. More of the younger women than of the younger men reported occasional illness.

The percentage distribution of respondents according to number of ailments cited by the individual is as follows:

No. of ailments per individual	Percentage of respondents
0	13
1	17
2	13
3	12
4	10
5	10
6	6
7	5
8	4
9 and more	10

A study of the menus failed to reveal any significant differences in type of menus for groups of people who had the larger numbers of ailments. However, individual case histories such as the following of a man of 51 years suggest relationship between the diet and the recognized ailments:

<i>Breakfast</i>	<i>Noon Meal</i>	<i>Evening Meal</i>
Egg, fried	Spare ribs	Baked beans
Rolls, 2	Baked beans	Bread
Butter	Potatoes	Coffee
Coffee	Creamed corn	Cream
	Bread, butter	
	Coffee, cream	
	Apple pie, 2 pieces	

Ailments:	
Arthritis	Rheumatism
Tendency to bleed	Hernia
Broken bones	Lack of mental application
Colds	Muscle and joint pains
Eye troubles	Neuritis
Chronic fatigue	Nervous and irritable
Many decayed and filled teeth	Night blindness
Swollen gums	"Not often sick"
Pneumonia	

Though actual illness may not be a frequent occurrence, these numerous conditions combine to keep the individual from enjoying buoyant health, such as might be attained if the diet had been reinforced habitually with milk, green and yellow vegetables, and some vitamin-C-rich foods, as the citrus fruits, tomatoes, raw greens or melons.

A second example of a farm owner and operator aged 59 repeats the picture:

<i>Breakfast</i>	<i>Noon Meal</i>	<i>Evening Meal</i>
Egg	Chicken-noodle	Apple pie
White bread	soup	White bread
Butter	Apple pie	Butter
Coffee	Coffee with cream,	Milk
Snacks of apples	sugar	

Ailments:

Arthritis	Muscle and joint pains
Eyes inflamed, burn, itch	Nervous and irritable
Eyes, over-sensitive to light	Night blindness
Chronic fatigue	No sickness, but "just shot all the time"
Frequent headaches	
False teeth	

While improvements in diet may not be the only measures needed to raise the level of health, they are fundamental to any other steps which may be taken. An important phase of the problem is changing the attitudes toward certain foods. Efforts to improve food habits must consider the varied attitudes toward foods of people of different age and sex groups, of different economic status, places of residence and nationality origins.

SUGGESTIONS FOR RESEARCH CONCERNING FOOD HABITS AND ATTITUDES

A daily dietary record provides a useful means of determining the food habits of groups of people. Data derived from menus recalled for the day preceding the interview compare closely, in this study, with data derived from the menu of meal immediately preceding the interview. The possible memory bias does not seem to be a seriously interfering factor for group comparisons.

An analysis of preferred menus (those which respondents say they would like if there were no restrictions of food selection) affords a valuable approach to ascertaining food preferences. Information from this source is easier to interpret than that derived from statements regarding attitudes toward foods.

People find it difficult to differentiate between degrees of preference for certain foods. Probably the most significant categories are "like," "dislike" and "not tried." It is also difficult for people to give reasons for their attitudes toward food, especially reasons for favorable attitudes.

In a study such as this the following were the major steps to be taken after clearly formulating the objectives:

- (1) Making the schedule and formulating the questionnaire.
- (2) Designing the sample.
- (3) Training the interviewers.
- (4) Obtaining the information; supervising the interviewers.
- (5) Editing and coding the schedules and questionnaires.
- (6) Punching the information on I.B.M. cards.
- (7) Formulating tables which will give the information desired about the groups being studied.

(8) Subjecting differences to statistical analysis.

(9) Interpreting the findings.

A study of this type is useful in obtaining an over-all view of the food habits of groups of people. The information obtained is important to numerous groups of people, such as food producers, processors, distributors and dealers; doctors and dentists; and nutrition educators.

SUGGESTIONS FOR NUTRITION EDUCATION

Nutrition education programs in Iowa should emphasize *the use of milk; the vitamin-C-containing foods such as citrus fruits, tomatoes, strawberries, melons; and the green and yellow vegetables*. The addition of these foods to the daily diets of meat, potatoes, bread, dessert and beverage would greatly improve the nutrient supply of Iowa people.

The frequency of marks of ill-health and disease among middle-aged Iowans suggests that something in their manner of living is leading to early degeneration of health. The prime of life is evidently being curtailed in this population group much as has been demonstrated in carefully controlled animal experimentation in which dietary restrictions have been shown to be the causative factors. In such animal studies the increased use of milk alone has been shown to be effective in delaying the onset of old age and in increasing the prime of life.

In view of these observations, perhaps the most important nutritional problem of Iowa is how to increase the use of milk. Difficulties arise from attitudes toward this food. Although it is regarded as a healthful food, it is not a food for which people have a high appetite level. A high degree of preference for butter, a refined product of milk much lower in general nutritive quality than milk itself, may operate against the production and distribution of sufficient amount of fluid milk. A reluctance to accept milk in processed forms, as evaporated and dried, also restricts the use of milk.

Inspection of menus suggests that milk consumption might be considerably increased through the greater use of milk in prepared foods. Breakfast is a meal conspicuously lacking in milk. Unless breakfast cereal is used, this meal usually contains practically no milk. An increasing tendency for sweet rolls, doughnuts and the like to replace breakfast cereal may materially reduce the milk consumption. The general concept regarding breakfast beverages seems to have taken the nutritionally erroneous form of "coffee or milk." A much wiser attitude would be "milk, and coffee if desired." It is unfortunate that such substances as tea and coffee should ever be regarded as alternates for milk.

The lower frequency of use of milk by older people as compared with younger people suggests that much emphasis need be given the fact that milk is important for older as well as for younger people—that it is not a food for the young only.

Two channels are suggested for increasing the use of the vitamin-C-containing foods: (1) fruit or fruit juice for breakfast, and (2) greater use of salads.

A surprisingly small percentage of the people seem to use fruit for breakfast. Tomato juice, which should be generally available to Iowa people throughout the year, is seldom used either for breakfast or as a first course for other meals. The popularization of tomato juice would increase both the vitamin C content of the diets and the vitamin A value. Since people indicate that they would like to have more salads than they have, more emphasis should be given to the preparation of easily made, nutritious salads.

The third food group which needs emphasis in Iowa consists of the green and yellow vegetables and fruits. A very limited number of these is used. Nutrition education should stress the variety of foods of this type and their contribution beyond that of the other vegetables and fruits. People would apparently like the foods better if they were prepared in a more tasty and attractive manner. The present tendency is to associate these foods with the main meal of the day. Certain differences in attitudes seem to exist with respect to age, sex and place of residence. The use of this group of foods is apparently more satisfactory in urban than in rural areas.

The so-called "basic-seven" plan⁵ is a practical guide to a good daily dietary. It has been criticized on the basis of being too complex. In a state like Iowa where the consumption of meat, cereals, fats, sweets and potatoes is generally satisfactory, or in surplus, the recommendations for obtaining a good diet might be simplified by concentrating on the three food groups discussed, *i.e.*, milk, vitamin-C-rich fruits and vegetables, green and yellow vegetables. This approach, however, should not underrate the importance of protein and calory-containing foods. Food habits are not homogeneous. Many people undoubtedly need nutrition instruction in the use of groups of foods other than the three indicated. It must be recognized also that there are many ways to obtain a good diet. Some people may be meeting their nutritional needs by patterns other than those recommended.

⁵The "basic seven" food groups set up by the Department of Agriculture and the War Food Administration as an aid to the nontechnical teaching of nutrition. See footnote 1, page 884.

Increasing the variety of foods in each food group used by Iowa people appears to be another problem for nutrition educators. Monotony of food selection is apparent in meats, vegetables, fruits and breads. A greater variety in the use of foods lends nutritional safety as well as interest to the diet. Fish, lamb and organ parts of meat are not liked and not used. Many highly nutritious vegetables have not been tried. Bread is made almost exclusively of wheat flour, usually the white refined type. The infrequency of use of cornbread in this state is surprising.

Menu making is a phase of nutrition education which should be carefully studied. The past methods of teaching this process, which is so vital to the nutrition of the family, should be critically evaluated. There is little evidence that Iowa homemakers generally give systematic thought to it. In a state where an abundance of good food is available and incomes are generally good, the skill of the homemaker in planning meals becomes a most important factor in determining the nutrition of the family. The records obtained in this study indicate a general lack of skill and imagination in the use of foods from day to day.

Foods that are satisfying and filling and those which "taste good" are the popular foods. *Good food preparation therefore becomes a most important means of improving food habits!* This has a more powerful appeal than that of knowledge regarding the health-giving properties of food. The latter does not seem to make much practical difference in food selection.

There are many *misconceptions about the nutritive properties* of foods. Practices among both overweight and underweight people indicate a poor understanding of their nutritional needs.

For practical nutrition education programs in Iowa, the present study suggests the need for simplifying the recommendations for a good daily diet, concentrating on the shortcomings of the particular group of people involved, developing more skill and interest in homemakers regarding menu making, stimulating an interest in the use of a greater variety of foods, and disseminating more information regarding the nutritive values of foods and the role of nutrition in health.

The food habits of the people of Iowa were found to differ somewhat with age, sex, section of the state, and place of residence whether rural or urban. Taking these differences into account may help in planning more effective nutrition education programs.

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APPENDIX A

THE SAMPLING PLAN AND ANALYSIS OF DATA¹

The Iowa General Purpose Sample was constructed to serve as a basic sample which would be suitable for a number of different inquiries and also be ready for field use within a short time after a survey sampling design request has been filed with the Laboratory. It was intended for use as a sample of households, farms, or individual persons, or some part of these populations. In general the sample is most useful for surveys attempting to cover relatively broad fields of inquiry rather than very specialized and restricted fields. The "food preference" sample was a modified version of this General Purpose sample, the main difference being the size (in terms of number of households) of sampling unit, which for the food preference sample was larger. This modification represented, to some extent, a compromise among time and cost considerations for this particular survey and a desired increased sample size which would yield more reliable estimates of the populations under inquiry.

SAMPLING DESIGN

The universe sampled for the food preference survey consisted of all men and women aged 17-19 and 46-58 years inclusive, in the urban, rural place and open country zones of Iowa. The proportions of the young age group to the older age group within sex class and of male to female within age group were not predetermined for the sample but were measured by the sample itself.

DEFINITION OF ZONES

Three zones were distinguished: the urban, rural place and open country.² The urban zone consisted of all incorporated places having a 1940 population³ of 2,500 people or more. The rural place zone consisted of all incorporated places having a population less than 2,500 (according to the 1940 census), of unincorporated name places, and of areas other than incorporated or unincorporated name places having a population density of 100 or more per square mile. All areas outside the urban and rural places were considered the open country zone.

The sample for the state was distributed among the three zones in an effort to have roughly equal sampling accuracy for each. In 1940 the open country and urban zones were of approximately the same size in terms of inhabitants, and the rural place zone was about one-half as large. Therefore, the over-all sampling rate in the rural place zone was increased to one out of 172, about double the other zonal rates. (This gave roughly equal numbers of persons in the sample for each of the three zones.)

For the Quartermaster food preference survey, the sampling unit (s.u.) for all zones was a small area of land averaging 15 households in size (see type and size of segment, page 963). The over-all or zonal sampling rates were as follows:

for the open country zone,	1 out of 333.3 s.u.'s
for the rural place zone,	1 out of 172 s.u.'s
for the urban zone,	1 out of 328 s.u.'s

¹Prepared by Jauvanta M. Walker, Statistical Laboratory, Iowa State College.

²Jessen, R. J. The Master Sample of Agriculture: Part II, Design. Jour. Amer. Stat. Assn., 40:46-56. March, 1945.

³"Population," unless specified otherwise, refers to the entire 1940 Iowa state population of persons including all age groups with no restrictions.

STRATIFICATION OF THE OPEN COUNTRY AND RURAL PLACE ZONES (AREA STRATIFICATION)

Area stratification is a process of dividing a land area into smaller contiguous areas according to some preconceived plan. For this survey, Iowa was divided into smaller areas of contiguous counties in an attempt to group the more alike counties together. The sampling design had two stages of sampling: i.e., (1) selection of a sample of counties, and (2) selection of a sample of s.u.'s from these counties. In stratification and for the first stage of sampling, the open country and rural place zones were pooled, and their combined rural 1940 population was used as a measure of size (this follows the Bureau of the Census definition of "rural" and is equivalent to the sum of the open country and the rural place populations). The reason for a pooling of zones was that it was desired that both zones have identical strata and that the sampling units chosen for the sample for each zone fall within the same few counties. This could cut down travel costs while still insuring that, within the two zones, all s.u.'s, and consequently all eligible persons, had known chances of being selected for the sample.

There are 99 counties in Iowa. The strata for the pooled open country and rural place zones are the five major farming areas in Iowa: (1) Northeastern Dairy, (2) Cash Grain, (3) Western Livestock, (4) Southern Pasture and (5) Eastern Livestock. Each stratum was subdivided into four substrata, making a total of 20. The substrata consisted of areas averaging in size five contiguous counties each. All substrata had approximately equal numbers of rural population, according to the 1940 census of population, and each had boundaries following county lines.⁴

SELECTION OF A SAMPLE OF COUNTIES (FIRST STAGE OF SAMPLING)

The primary sampling unit (p.s.u.) for the open country-rural place substrata was the county (99 p.s.u.'s in the state). One p.s.u. was selected for the sample on a total rural (census definition of "rural") population basis to represent each of the 20 substrata. That is, before the random draw the probability of county i 's being chosen from substratum j was the ratio of the county's rural population to the substratum total rural population. (See appendix table 1, p. 957.)

SELECTION OF SEGMENTS WITHIN SAMPLE P.S.U. (SECOND STAGE OF SAMPLING)

At this stage, the combined rural population was broken down into its two component zonal populations, and the open country zone and the rural place zone were sampled separately. Since this was a two-stage sampling design, the sample number of s.u.'s wanted from a substratum was selected from the one primary sampling unit or county which was chosen for the sample from that substratum, employing a scheme known as area substratification.⁵ For purposes of clarity, any s.u. selected for the sample is called a *segment*.

⁴See map on page 881.

⁵Hansen, Morris H. and William N. Hurwitz. On the Theory of Sampling from Finite Populations. *Annals of Math. Stat.*, 14:333-362. 1943.

APPENDIX TABLE 1. OPEN COUNTRY AND RURAL PLACE ZONES:
SELECTION OF P.S.U.'s.

STRATUM I—NORTHEASTERN DAIRY REGION.

Sub-stratum number	County or p. s. u.	1940 Population			No. of open country s. u.'s	Cumulated total of rural pop.	P. s. u. selected for sample
		Total rural	Open country	Rural place			
1.....	Allamakee....	14,212	10,212	4,000	166	14,212	X
	Clayton.....	24,334	13,420	10,914	231	38,546	
	Fayette.....	21,350	13,571	7,779	257	59,896	
	Winneskie....	16,960	12,677	4,283	234	76,856	
	Total.....		49,880	26,976	888		
2.....	Black Hawk..	18,854	15,108	3,746	176	18,854	X
	Bremer.....	13,776	8,996	4,780	170	32,630	
	Buchanan....	16,649	11,788	4,861	207	49,279	
	Chickasaw... Howard.....	12,294 10,001	8,763 7,752	3,531 2,249	172 148	61,573 71,574	
	Total.....		52,407	19,167	873		
3.....	Butler.....	17,986	9,820	8,166	183	17,986	X
	Cerro Gordo..	13,001	10,268	2,733	161	30,987	
	Floyd.....	11,488	7,721	3,767	158	42,475	
	Mitchell....	10,925	7,915	3,010	147	53,400	
	Winneshago.. Worth.....	11,427 11,449	7,475 6,833	3,952 4,616	129 140	64,827 76,276	
	Total.....		50,032	26,244	918		
4.....	Delaware.....	14,725	10,640	4,085	186	14,725	X
	Dubuque.....	19,876	13,589	6,287	186	34,601	
	Jackson.....	15,105	10,096	5,009	176	49,706	
	Jones.....	13,335	9,948	3,387	186	63,041	
	Total.....		44,273	18,768	734		

OPEN COUNTRY ZONE

As mentioned before, the sampling unit for all zones was a small area of land averaging 15 households in size. Sampling units roughly one-third that size had already been defined and mapped for all open country for the Master Sample of Agriculture. So a cluster of three master-sample-sized units (m.s.s.u.'s) was considered to be the QM s.u. in open country.

Application of the zonal over-all sampling rate of 1 out of 333.3 to the zone total number of universe s.u.'s and to the zone 1940 population would give the expected numbers of segments and of unrestricted population in sample segments for the zone. Applying this zonal rate to corresponding substratum universe totals gave expected numbers of segments and of unrestricted population (inhabitants of all ages) in those segments for each substratum. Just such a process was gone through to derive the within sample p.s.u. sampling rate, as follows:

The number of segments selected for the sample, n s.u.'s, from a sample p.s.u. was, for the open country zone, determined by the formula:

$$n = \frac{RN}{r}$$

where R = the over-all sampling rate;

r = the ratio of the county open country 1940 population to that for the substratum;

N = the number of open country sampling units in the sample p.s.u.

APPENDIX TABLE 2. OPEN COUNTRY ZONE: SELECTION OF SEGMENTS (DETAIL SHOWN FOR ONE TYPE OF FARMING AREA ONLY).

Stratum	Total universe no. of o. c. s. u.'s in stratum and sub- strata	Sample p. s. u.	Universe no. of o. c. s. u.'s in p. s. u.	Calculated n	Sampling rate within p. s. u.	Random num- ber start for within p. s. u.	No. segments selected for sample
I Northeastern Dairy	3,413	Winneshiek...	234	2.76	1/84.7	70.3	8
Substratum 1	888	Black Hawk...	176	1.83	1/96.1	70.3	2
Substratum 2	873	Butler	183	2.80	1/65.4	22.7	2
Substratum 3	918	Dubuque	186	1.82	1/102.3	101.7	3
Substratum 4	734						1
II Cash Grain	3,518						10
III Western Livestock	4,112						13
IV Southern Pasture	3,324						10
V Eastern Livestock	3,794						12
Total	18,161						53

This becomes:

$$n = \frac{\text{(No. of people excepted in sample segments in the substratum)}}{\text{(Total p.s.u. open country 1940 pop. of persons)}} \cdot \frac{\text{(P.s.u. cumulated total number of s.u.'s)}}{1}$$

The within p.s.u. sampling rate then was the ratio, n/N . This sampling rate was applied against the cumulative listing of o.c. s.u.'s in the p.s.u. and the actual segments selected with systematic randomness. (See appendix table 2.) On an average, the within p.s.u. sampling rate when multiplied by the arbitrary p.s.u. rate (i.e., the rate at which the p.s.u. was drawn into the sample) will equal the over-all sampling rate for the zone. This was true in all zones.

RURAL PLACE ZONE

There were two different kinds of sampling unit in the rural place and urban zones: (1) a small area of land containing a cluster of households all of which were sample households, and (2) a number of designated households which were not necessarily contiguous with one another but were contained along with other households in a larger area of land. (These households generally constituted a certain predetermined fraction of the households contained in a city or town block and were designated by a random systematic subsample of that block.) Both kinds of s.u. contained about 15 expected households.

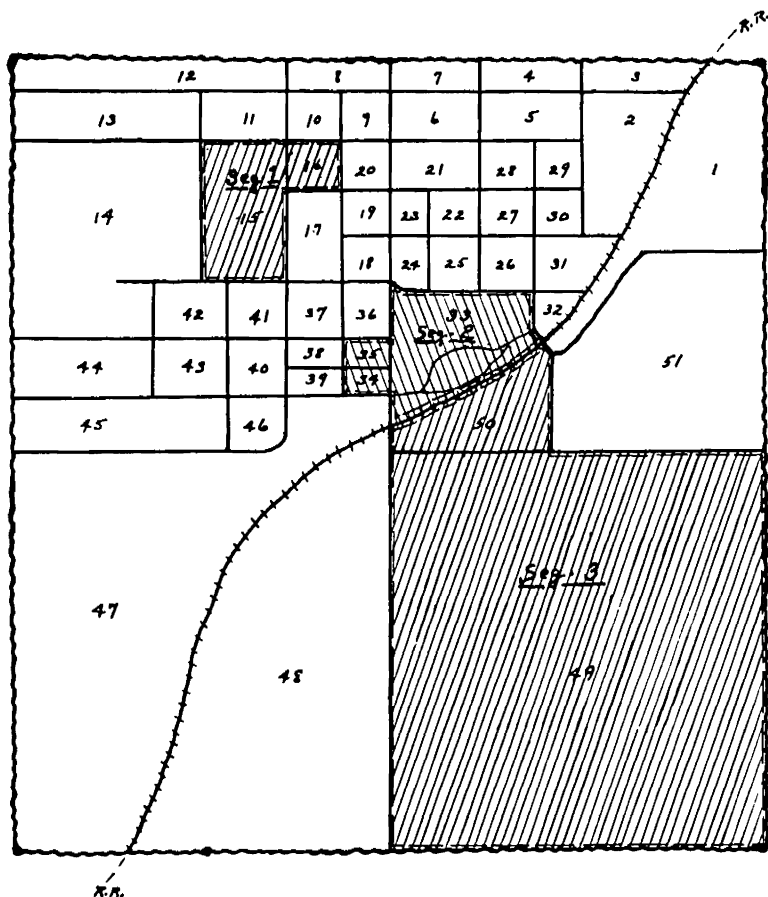
Within the rural place zone, the sample p.s.u. for each substratum was the same as for the open country zone, since the p.s.u. was originally drawn into the sample on the basis of the pooled open country and rural place populations of persons. The number of rural place segments within each selected p.s.u. was determined in a manner similar to that in the open country zone but by using the rural place populations. (See formulae on p. 957 and 959.)

For the Iowa General Purpose sample design, it was decided that approximately one sample segment should be taken within any selected rural place. About twice this limit was used in the design of the food preference survey, rather than as in the Iowa General Purpose sample, to determine the number of rural places to be selected for the sample. This change was made to correspond with the doubled over-all sampling rate of 1 out of 172 for the rural place zone. The rural places were then ordered within p.s.u.'s and a sampling rate, changing with p.s.u., was applied against cumulated rural place 1940 populations to yield the expected number of rural places.

For example, Adair town was the one rural place which came into the sample from Adair County (p.s.u.) in substratum 1, Southern Pasture area. There were N or 101 universe s.u.'s in the p.s.u. and 21 in Adair town. The within p.s.u. sampling rate, n/N , was calculated to be about .022, or 1 out of 46.3 s.u.'s ($n=2.22$). The sampling rate within Adair town would then be

$$\begin{aligned} & \frac{n}{N} \cdot \frac{\text{(p.s.u. universe no. of s.u.'s)}}{\text{(total no. s.u.'s in Adair town)}} \cdot \frac{1}{\text{(no. of sample rural places in p.s.u.)}} \\ &= \frac{n}{N} \cdot \frac{101}{21} \cdot \frac{1}{1} = \frac{n}{21} = \frac{1}{9.46} \end{aligned}$$

Blocks in Adair town had been ordered in a serpentine manner, numbered, and combined into s.u.'s averaging 15 dwelling units in size. (See appendix fig. 1.) The s.u.'s were cumulated in the same ordering as blocks, a random number start was drawn, and three segments were then selected systematically at the rate of 1 out of 9.46 s.u.'s.



~~~~~ = rural place boundary  
 +++++ = railroad  
 ————— = street (block boundary)  
 Crosshatching indicates s.u. selected  
 for the sample.

1940 population of Adair = 863.  
 S.U. averages 15 structures in size.  
 No. of universe s.u.'s = 21.  
 No. of s.u.'s selected for the sample  
 = 3.  
 Sampling rate within Adair town =  
 1 out of 9.46 s.u.'s

Appendix Fig. 1. Rural Place Zone: Ordering of blocks within sample place and location of sample segments.

Adair, incorporated rural place, in Adair County: Sketch showing blocks and street patterns, made from aerial photos.

For the state, there was a total of 34 rural places selected for the sample, or from one to two rural places selected per sample p.s.u. The expected sample population of persons within a selected p.s.u. was in effect divided equally between the sample rural places in that p.s.u.

# STRATIFICATION OF THE URBAN ZONE (SIZE-CLASS STRATIFICATION OF A NONCONTIGUOUS NATURE)

The urban zone was divided into the following four strata: (1) places having a population of 2,500-5,000; (2) places having a population of 5,000-10,000; (3) places having a population of 10,000-50,000; and (4) places having a population of 50,000 and over. A stratum of this sort is of a noncontiguous nature since it is made up of a number of scattered incorporated places, which are not contiguous geographically. The stratification itself is determined by population boundaries (political boundaries) and certain sizes of populations, not by natural geographical lines as such.

## FIRST STAGE OF SAMPLING IN THE URBAN ZONE

For the urban zone the primary sampling unit was an urban place or portion of one. All urban places in Iowa were arranged by geographical location and by size within the urban strata (i.e., counties in the state were ordered geographically into clusters of approximately 11 counties each; within cluster, urban places were ordered alphabetically into population size-classes). Within each stratum one p.s.u. was selected for the sample on an unrestricted population basis for every 50,000 persons. This meant that in stratum 4, of places having an unrestricted population of 50,000 or more, the p.s.u. was part of an urban place. A random draw within each cumulation of 50,000 people selected 18 urban places for the sample. (See appendix table 3.)

## SECOND STAGE OF SAMPLING IN THE URBAN ZONE (SELECTION OF SEGMENTS)

The sample number of people,  $m_i$ , per  $i^{\text{th}}$  urban place (from the unrestricted population) was determined by

$$m_i = (\text{over-all zone sampling rate}) (50,000)$$

APPENDIX TABLE 3. URBAN ZONE: SELECTION OF P.S.U.'s. STRATUM 3 (ALL URBAN PLACES HAVING 1940 POPULATIONS OF 10,000 TO 50,000 PERSONS).

| Arbitrary geographical group of counties | County        | Urban place name | 1940 population of urban place | Cumulative urban place population | P. s. u. or urban place selected for sample* |
|------------------------------------------|---------------|------------------|--------------------------------|-----------------------------------|----------------------------------------------|
| 1.....                                   | Dubuque....   | Dubuque....      | 43,892                         | 43,892                            | X                                            |
| 2.....                                   | Cerro Gordo.. | Mason City..     | 27,080                         | 70,972                            | X                                            |
| 3.....                                   |               |                  |                                |                                   |                                              |
| 4.....                                   |               |                  |                                |                                   |                                              |
| 5.....                                   | Jasper.....   | Newton.....      | 10,462                         | 81,434                            |                                              |
|                                          | Boone.....    | Boone.....       | 12,373                         | 93,807                            |                                              |
|                                          | Story.....    | Ames.....        | 12,555                         | 106,362                           |                                              |
|                                          | Marshall....  | Marshalltown.    | 19,240                         | 125,602                           | X                                            |
|                                          | Webster....   | Fort Dodge...    | 22,904                         | 148,506                           |                                              |
| 6.....                                   | Johnson....   | Iowa City....    | 17,182                         | 165,688                           | X                                            |
|                                          | Muscatine...  | Muscatine....    | 18,286                         | 183,974                           |                                              |
|                                          | Clinton.....  | Clinton.....     | 26,270                         | 210,244                           |                                              |
| 7.....                                   | Mahaska.....  | Oskaloosa....    | 11,024                         | 221,268                           | X                                            |
|                                          | Lee.....      | Fort Madison.    | 14,063                         | 235,331                           |                                              |
|                                          | Lee.....      | Keokuk.....      | 15,076                         | 250,407                           |                                              |
|                                          | Des Moines... | Burlington....   | 25,832                         | 276,239                           | X                                            |
|                                          | Wapello.....  | Ottumwa.....     | 31,570                         | 307,908                           |                                              |
| 8.....                                   |               |                  |                                |                                   |                                              |
| 9.....                                   | Pottawattamie | Council Bluffs   | 41,439                         | 349,248                           | X                                            |

\*Random number start for systematic sampling = 11,258.

APPENDIX TABLE 4. URBAN ZONE: SELECTION OF SEGMENTS. STRATUM  
3 (ALL URBAN PLACES HAVING 1940 POPULATIONS  
OF 10,000 TO 50,000 PERSONS).

| County           | Name of sample urban place | 1940 pop. of sample place | $m_1$ | Cum. no. of s. u.'s in sample place, N | Calculated n | Sampling rate within sample place | No. segments selected for sample* |
|------------------|----------------------------|---------------------------|-------|----------------------------------------|--------------|-----------------------------------|-----------------------------------|
| Dubuque.....     | Dubuque.....               | 43,892                    | 152   | 448                                    | 1.551        | 1/288.8                           | 2                                 |
| Cerro Gordo....  | Mason City ..              | 27,080                    | 152   | 297                                    | 1.667        | 1/178.2                           | 2                                 |
| Marshall.....    | Marshalltown..             | 19,240                    | 152   | 211                                    | 1.667        | 1/126.6                           | 2                                 |
| Johnson.....     | Iowa City.....             | 17,182                    | 152   | 197                                    | 1.743        | 1/113.0                           | 2                                 |
| Mahaska.....     | Oskaloosa.....             | 11,024                    | 152   | 134                                    | 1.848        | 1/72.5                            | 1                                 |
| Des Moines....   | Burlington....             | 25,832                    | 152   | 320                                    | 1.883        | 1/169.9                           | 2                                 |
| Pottawattame..   | Council Bluffs             | 41,439                    | 152   | 632                                    | 2.318        | 1/272.6                           | 2                                 |
| Stratum total... | .....                      | .....                     | ..... | .....                                  | 12.677       | .....                             | 13                                |

\*A random number start was drawn for each selected urban place; then sampling within place was systematic.

except for places having a 1940 population exceeding 50,000 people, for which it became

$m_1 = (\text{over-all zone sampling rate}) (\text{place}_1 \text{ population})$

The number of segments selected for the sample,  $n$  s.u.'s, within each chosen urban place in the urban zone is as follows:

$$n = \frac{(\text{Expected no. of people in sample place})}{(\text{Unrestricted total pop. of place})} \bullet (N)$$

where  $N$  = the cumulated total number of s.u.'s in the sample urban place. The within urban place sampling rate then was the ratio  $n/N$ , and was applied against  $N$  in a random systematic way. (See appendix table 4.) The  $N$  sampling units had been ordered within urban place in a serpentine, contiguous manner as in rural places before cumulation.

## MATERIALS FOR CONSTRUCTING SAMPLING UNITS

In processing materials for the survey, the Statistical Laboratory used a technique of determining from aerial photographs the number and distribution of sampling units in rural places and in urban places having populations less than 50,000. A tracing was made from the aerial photos for each place, dividing it into small areas bounded in general by streets. These areas were numbered in a serpentine, contiguous manner (as in appendix fig. 1). The structures within each such area were counted, and these photo estimates of the number of dwelling units were used as measures of size of each area. The structure count was converted to a sampling unit count or list to get an average of 15 expected dwelling units per sampling unit. Segments which came into the sample were determined by a random systematic scheme based on the cumulative s.u. count.

Housing bulletins containing block statistics published by the Bureau of the Census were used to determine sampling units for places having a 1940 population of 50,000 or over.

In open country areas the materials used for sampling purposes were those prepared for the Master Sample of Agriculture.<sup>6</sup>

<sup>6</sup>Jessen. *op. cit.*

### TYPE AND SIZE OF SEGMENT

The QM food preference s.u. was defined as follows:  
For the open country zone:

QM s.u. = cluster of three adjacent master-sample-sized units (i.e., m.s.s.u.'s)  
= 15 expected dwelling units.

For the rural place and urban zones:

QM s.u. = cluster of 15 expected dwelling units.

The special-age-group restriction laid on the population to be sampled was used directly in the design only in determining eligible respondents in the field. The population mentioned in the description of the design is the total Iowa 1940 population regardless of ages.

### SUMMARY OF SAMPLE COMPOSITION

The over-all rate for the open country zone = 1 out of 333.3;  
for the rural place zone = 1 out of 172;  
for the urban zone = 1 out of 328.

These sampling rates were such as to yield an estimated 1,300 eligible respondents with approximately 433 of these in each zone. According to the plan, each of the four parts of the questionnaire dealing with food preference items would be used about 325 times, and about 2,100 dwelling units would need to be visited to find 1,300 persons in the two specified age-groups. (See the following section and Interviewer Instructions for Listing, p. 969). The sample consisted of 20 counties, 34 rural places, and 18 urban places, from which a total of 157 s.u.'s were drawn (53, 54 and 50 s.u.'s in the open country, rural place and urban zones, respectively).

### SELECTION OF ELIGIBLE RESPONDENTS WITHIN THE SAMPLE SEGMENT AND OFFICE CHECKS ON FIELD WORK

Listing<sup>7</sup> within the sample segments, done by the interviewers, provided a Statistical Laboratory check on the interviewers' abilities to locate sample segments accurately, gave certain personal information on all people living within those areas, and was the basis for the Laboratory's selecting objectively the eligible respondents to be interviewed. All households in the chosen segments were taken for the sample for listing purposes.

All persons listed from sample households, who were in either specified age-group (17-19 and 46-58 years), were considered eligible respondents for this survey. However, to conserve time and money, it was decided that no attempt would be made to interview those eligibles who had indicated at listing time an unwillingness or refusal to be interviewed. Instead, adjustment would be made for their schedules as for any other noninterview. (See Transcription of Data and Adjustment for Noninterviews, p. 964-966.)

After interviewing began, progress sheets were sent in regularly from the field. Interviewers were to call back on respondents not-at-home at first visit.

### QUESTIONNAIRE AND INTERVIEWER TRAINING FIELD-TESTING THE QUESTIONNAIRE

A preliminary Quartermaster Food and Container Institute food preference questionnaire was tested on more than 100 17-19-year-old

<sup>7</sup>See listing instructions (p. 969).

boys and girls from public schools of various sizes and locations, also on a few older people in Ames. No random or systematic method of selecting students was used. Respondents, in general, were those students who could take the required time from study hall or classes without jeopardizing their studies. Both individual and modified group interview situations were tested. On the basis of these experiences the QM questionnaire was modified and, in some instances, clarified. The time required for interview was judged to be far too long to be used effectively or to yield sound data.

### QUESTIONNAIRE

The final questionnaire used in the field consisted of a shortened form of that prepared by the Food Acceptance Branch of the QM Food and Container Institute for the Armed Forces, with certain supplemental sections particularly wanted by the Iowa State College Foods and Nutrition Department:

- (1) Menu of meals for the day preceding the interview.
- (2) Menu of the meal most immediately preceding the interview.
- (3) Preferences for an abbreviated list of selected foods and groups of foods.

The Statistical Laboratory recommended dividing the questionnaire into sections so that each respondent would be required to answer only certain sections, by a rotating scheme, in an attempt to help solve the refusal, disinterest and fatigue problems of long interviews. Elicited from all respondents were personal information, actual menu data and data on 36 main groups of foods. Food preference questions were each answered by one-fourth of the respondents. The particular one-fourth of the food preference section to be answered by any given respondent was decided randomly by the Statistical Laboratory after listing information was obtained.

### INTERVIEWER SCHOOL

Interviewers were in general former home economics students and extension home economists scattered through the state. An Interviewers' School covering the sampling procedure in the field was conducted at Iowa State College by the Statistical Laboratory for those interviewers able to attend.

### MISCELLANEOUS

#### TRANSCRIPTION OF DATA AND ADJUSTMENT FOR NONINTERVIEWS

On return from the field questionnaires were edited and coded by Home Economics and Statistical Laboratory personnel. Adjustments were made for missing interviews. The editing process consisted in part of checking over questionnaires for completeness and reasonableness of responses, specifically indicating blank responses by writing in "N.I." (for "no information") or "0" (where the answer was "none"). Coding involved a transformation of written responses (data) into coded numbers for each question for ease in handling. Coded data were then punched on approximately 150,000 IBM cards to permit rapid tabulation.

Missing interviews were of several types:

*Type 1:* for eligible respondents, specified for interview after listing, who could not be interviewed in the field for reasons such as "segment

inaccessible due to muddy roads," "out of town," "gone to college," "ill" and "refused."

Type 2: for eligibles in sample households who were not specified for interviewing

- (a) because they had indicated at listing time a strong reluctance or refusal to be interviewed later, or because of language difficulty, deafness or other inability to give an interview.
- or (b) because, in a few cases, the total number of eligibles found in a sample segment was so large, because of recent building operations, that the interviewer would have had to spend a week or so interviewing in the segment. In such cases, the number specified for interview was cut down by drawing a random systematic subsample of the listed eligibles, and office duplication of some of the completed questionnaires was intended to bring the number of questionnaires up to the total number of eligibles originally in the sample segment.

or (c) because of central office omission of listed eligibles by error.

Altogether, 2,400 households were visited in the sample segments. Of these, 924 had eligible respondents (400 having two or more eligibles in the household). This indicates that on an average, 2,597 households had to be visited to find any eligible respondents. Appendix table 5 gives zonal results of the field work.

To keep the balance for zone, age group and sex class of eligible respondents provided by the sample design, the Statistical Laboratory chose, for each Type 1 missing interview, a completed questionnaire from the same sample segment or, if that was impossible, from the most nearly adjacent segments in the same zone. This selection was randomly made from the same age-sex group as that of the missing interview. The selected questionnaire was then duplicated, and its data were punched on two sets of IBM cards, one for the chosen completed questionnaire and the duplicate set for the missing interview.

Duplication for noninterviewed eligibles results in a certain amount of error for the local area (segment), but this error tends to balance

APPENDIX TABLE 5. ANALYSIS OF THE 1408 ELIGIBLE RESPONDENTS.

| Zone                          | Age-sex group |     |     |     | Total |
|-------------------------------|---------------|-----|-----|-----|-------|
|                               | YM            | YF  | OM  | OF  |       |
| Open country                  |               |     |     |     |       |
| No. of interviews.....        | 43            | 35  | 142 | 116 | 336   |
| No. Type 1 noninterviews..... | 12            | 9   | 16  | 7   | 44    |
| No. Type 2 noninterviews..... | 3             | 0   | 4   | 3   | 10    |
| Total.....                    | 58            | 44  | 162 | 126 | 390   |
| Rural place                   |               |     |     |     |       |
| No. of interviews.....        | 29            | 35  | 122 | 165 | 351   |
| No. Type 1 noninterviews..... | 7             | 7   | 37  | 32  | 83    |
| No. Type 2 noninterviews..... | 5             | 1   | 10  | 14  | 30    |
| Total.....                    | 41            | 43  | 169 | 211 | 464   |
| Urban                         |               |     |     |     |       |
| No. of interviews.....        | 22            | 63  | 126 | 153 | 364   |
| No. Type 1 noninterviews..... | 13            | 16  | 63  | 41  | 133   |
| No. Type 2 noninterviews..... | 6             | 5   | 21  | 25  | 57    |
| Total.....                    | 41            | 84  | 210 | 219 | 554   |
| State total.....              | 140           | 171 | 541 | 556 | 1408  |

Y=age of 17-19; O=46-58. M and F=sex of eligible respondent.

APPENDIX TABLE 6. ZONAL BREAKDOWN OF THE 1311 QUESTIONNAIRES PUNCHED ON CARDS.

## A. Number of Interviews Obtained.

| Zone              | Age-sex group |     |     |     | Total |
|-------------------|---------------|-----|-----|-----|-------|
|                   | YM            | YF  | OM  | OF  |       |
| Open country..... | 43            | 35  | 142 | 116 | 336   |
| Rural place.....  | 29            | 35  | 122 | 165 | 351   |
| Urban.....        | 22            | 63  | 126 | 153 | 364   |
| Total.....        | 94            | 133 | 390 | 434 | 1051  |

## B. Number of Interviews Duplicated for (All Type 1 Noninterviews).

| Zone                      | Age-sex group |     |     |     | Total |
|---------------------------|---------------|-----|-----|-----|-------|
|                           | YM            | YF  | OM  | OF  |       |
| Open country.....         | 12            | 9   | 16  | 7   | 44    |
| Rural place.....          | 7             | 7   | 37  | 32  | 83    |
| Urban.....                | 13            | 16  | 63  | 41  | 133   |
| Total.....                | 32            | 32  | 116 | 80  | 260   |
| TOTAL of (A) and (B) .... | 126           | 165 | 506 | 514 | 1311  |

out over a large geographical area such as the zone. However, the duplication of questionnaires for missing interviews is not a substitute for missing data. It is intended merely to preserve the balance the sample was designed to have and permit pooling of zonal estimates from sample data, by use of the original sampling rates. If duplication is not made for missing interviews, these sampling rates are obscured, and the manner of operation of the laws of probability in the selection of each interviewed person is no longer clearly understood.

Since Type 2 eligibles had not been listed for interviewing, they were not accounted for when the checking-in of field returns and early processing of data were done. As a result, no duplication was made for those 97 noninterviews, and analysis proceeded with 1,311 sets of punched cards rather than 1,408. By the time the discrepancy was uncovered, processing of data had gone so far that the amount of money necessary for changing the processing and revising tables would have been so large that it would have prohibited any release of data in the near future. Appendix table 6 gives a zonal breakdown of the 1,311 questionnaires punched on cards (including those for completed interviews and those duplicated for, for noninterviews).

It is believed that the results obtained from analyzing 1,408 questionnaires (after duplicating for 357 noninterviews) would not be very different from the results which have been obtained from the analysis of 1,311 questionnaires, and that the rather broadly drawn conclusions presented in the main body of this report would not be changed. The main limitations of the data collected in this study lie in the nature of the 25 percent of the sample who were not interviewed. If these persons are very different from the 1,051 interviewed eligible respondents, those differences will bias the analysis of data, regardless of the sample total.

Urban zone noninterviews accounted for 56 of the 99 Type 1 noninterviews attributed to "refusals or too busy," for 50 of the "not available for a long period," and for 10 "no explanation" reasons.

APPENDIX TABLE 7. REASONS FOR THE 260 TYPE 1 NONINTERVIEWS.

| Reason for noninterview:                                                                                                        | No. of noninterviews |    |     |    |       |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------|----|-----|----|-------|
|                                                                                                                                 | YM                   | YF | OM  | OF | Total |
| 1. No explanation, or eligible omitted through error                                                                            | 3                    | 0  | 3   | 6  | 12    |
| 2. Not at home, 3 calls or more                                                                                                 | 0                    | 1  | 1   | 1  | 3     |
| 3. Not at home, 2 calls                                                                                                         | 0                    | 0  | 2   | 2  | 4     |
| 5. Refusal, or "too busy"                                                                                                       | 4                    | 7  | 60  | 28 | 99    |
| 6. Informant not available for long period of time:<br>i. e., in college, in military service, moved<br>away, out of town, etc. | 24                   | 24 | 39  | 25 | 112   |
| 7. Unable to answer because of physical disability:<br>i. e., illness, deafness, feeble-mindedness, etc.                        | 0                    | 0  | 9   | 16 | 25    |
| 9. Bad roads; interviewer unable to reach respondent's dwelling unit                                                            | 1                    | 0  | 2   | 2  | 5     |
| Total                                                                                                                           | 32                   | 32 | 116 | 80 | 260   |

APPENDIX TABLE 8. REASONS FOR THE 97 TYPE 2 NONINTERVIEWS.

| Reason for noninterview                                                                                             | No. of noninterviews |    |    |    |       |
|---------------------------------------------------------------------------------------------------------------------|----------------------|----|----|----|-------|
|                                                                                                                     | YM                   | YF | OM | OF | Total |
| 1. No explanation, or eligible omitted through error                                                                | 4                    | 0  | 13 | 16 | 33*   |
| 2. Not at home, 3 calls or more                                                                                     | 0                    | 0  | 1  | 2  | 3     |
| 3. Not at home, 2 calls                                                                                             | 0                    | 2  | 2  | 2  | 6     |
| 4. Not at home, 1 call, did not call back                                                                           | 0                    | 0  | 4  | 4  | 8     |
| 5. Refusal, or "too busy"                                                                                           | 0                    | 1  | 5  | 6  | 12    |
| 6. Informant not available for long period of time:<br>i. e., in college, in military service, out of<br>town, etc. | 9                    | 1  | 4  | 3  | 17    |
| 7. Unable to answer because of physical disability:<br>i. e., illness, deafness, feeble-mindedness, etc.            | 0                    | 0  | 1  | 4  | 5     |
| 8. Language difficulty                                                                                              | 0                    | 0  | 1  | 1  | 2     |
| 9. Bad roads; interviewer unable to reach respondent's dwelling unit                                                | 0                    | 0  | 1  | 0  | 1     |
| 10. Interview not obtained because of office sub-sampling of listed eligibles                                       | 1                    | 2  | 3  | 4  | 10    |
| Total                                                                                                               | 14                   | 6  | 35 | 42 | 97    |

\*Most of these, particularly in the urban zone, represent edited-in eligibles from households for which no information had been obtained at listing time as to the number of persons or number of eligibles in the household. Household information was most frequently not obtained because no one was found home on repeated calls.

## WEIGHTING OF SAMPLE TOTALS TO MAKE ZONAL COMPARISONS

Whenever tabulation and analysis of data were restricted to within-zone data with no attempt being made to compare zones or to make statements crossing zonal boundaries, the simple sample totals could be used. The raw data could be converted directly to averages or to percentages because the within-zone sampling rate was kept constant for any one zone.

However, when differences or likenesses among zones were to be studied or state averages or percentages computed, it was necessary to express zonal sample totals for any item in comparable terms. The difference in sampling rates among the three zones necessitated the use of weighting factors in the analysis of data on this state, or pooled, basis. The weights used varied with the reciprocals of the sampling rates and are as follows:



|                   | (1)                         | (2)                                   | $3 \times (1) \div (2)$ |
|-------------------|-----------------------------|---------------------------------------|-------------------------|
| Zone              | Reciprocal of sampling rate | Sum of zone sampling rate reciprocals | Zonal weight            |
| Open country..... | 333.3                       | 833.3                                 | 1.2000                  |
| Rural place.....  | 172.0                       | 833.3                                 | .6192                   |
| Urban place.....  | 328.0                       | 833.3                                 | 1.1808                  |
| Total.....        | 833.3                       |                                       | 3.0000                  |

EXAMPLE: Weighted percentage of sample that rates nuts as Very Good (Vg), based on the number asked about nuts (i.e., the weighted total number of eligibles):

| Zone            | Unweighted         |                             | Weight | Weighted                  |                      |         |
|-----------------|--------------------|-----------------------------|--------|---------------------------|----------------------|---------|
|                 | Sample no. for Vg. | Sample no. asked about nuts |        | Sample no. for Vg. rating | No. asked about nuts | Percent |
| Open country.   | 140                | 380                         | 1.2000 | 168                       | 456                  | 36.8    |
| Rural place.... | 150                | 434                         | .6192  | 93                        | 268                  | 34.7    |
| Urban.....      | 148                | 497                         | 1.1808 | 175                       | 587                  | 29.8    |
| Total.....      |                    | 1311                        |        | 436                       | 1311                 | 33.2    |

#### COMPARISONS OF SAMPLE ESTIMATES AND BUREAU OF THE CENSUS DATA

An attempt was made to compare 1940 Census data for the two special age groups with the sample totals. The census 11-13-year-olds and the 40-52-year-olds were used for comparative purposes rather than the 17-19 and 46-58, because, with the elapse of time between the collection of the census data and of the survey data (1946), it was thought such groups would more nearly approximate the populations sampled in the food preference survey.

For state totals with the three zones pooled, relative percentage ratios of  $\frac{\text{(younger age group)}}{\text{(older age group)}}$  are given below:

| State of Iowa         | Percentage ratio of young to old |        |       |
|-----------------------|----------------------------------|--------|-------|
|                       | Male                             | Female | Total |
| Sample estimate.....  | 25.79                            | 34.55  | 30.10 |
| 1940 census data..... | 32.50                            | 32.15  | 32.33 |

The age groups sampled in 1946 were not identical in composition with the 1940 census 11-13- and 40-52-year-olds because of deaths, interstate migrations and the effects of the war. The crude death rates in Iowa for all ages (by place of residence and exclusive of still-births—rates per 1,000 estimated population including armed forces present in the state but excluding armed forces overseas) varied from 10.4 in 1940<sup>8</sup> to 11.5 in 1945.<sup>9</sup>

<sup>8</sup>Statistical Abstracts of the United States, Table 78, p. 80. 1944-45.

<sup>9</sup>Vital Statistics—Special Reports, Table B; Vol. 26, No. 15, published June 30, 1947.

"Part of the increase or decrease in the rates may be accounted for by the changes in the age, race, and sex composition of the area. Of particular significance in this connection are:

- 1) the withdrawal of a large number of physically fit males of military age from the civilian population.
- 2) the concentration of such a population in military establishments in certain areas.
- 3) the movement overseas of a large number of men in the armed forces . . ."<sup>10</sup>

## COPY OF SAMPLING INSTRUCTIONS FOR THE INTERVIEWERS

### SAMPLING METHOD

The sampling technique used in this study is known as area sampling. This method requires the division of the total area under investigation into small geographic areas, so that the persons living on a sample of such areas will comprise an adequate cross section of all persons.

### SAMPLE SEGMENTS

These small areas to be surveyed will be called sample segments. They are colored in orange on the county maps, and where aerial photographs are used they will be outlined in blue. The county maps are usually drawn to a scale of  $\frac{1}{2}$  inch to a mile. The segments have been outlined, whenever possible, by readily identifiable boundaries, such as roads, rivers, railroad tracks or section lines. The segments vary in size in order to include an approximately equal number of dwelling units, generally 15 or 18. No matter how far the actual count of dwelling units within the segment varies from this general average, an accounting should be made of each dwelling unit. It is fully as important that all dwelling units within the segment are located and accounted for as it is to get an accurate interview. This sample information is an integral part of the total information to be obtained.

### THE HOUSEHOLD

A household consists of the occupants of a dwelling unit. This may be a family, or any group of persons living together, with common housekeeping arrangements. A person living alone, in separate living quarters, constitutes a household. The segment should be canvassed and call numbers assigned to each household in consecutive order, beginning with call number one, in each segment.

### LIST SHEET

Each household in the segment will be visited and every member of the household will be listed. A name does not necessarily have to be taken if a person does not care to give it. As soon as all listing is completed, list sheet and segment sheet will be returned to Ames where they will be analyzed for eligible respondents. Eligible respondents include all persons from the ages 17-19 inclusive, and 46-58 inclusive. List sheets and segment sheets will be returned to you within a few days with houses marked that are to be visited, persons that are to be interviewed checked with red pencil and section of the questionnaire to be used designated, such as Part I, Part II, Part III and Part IV.

### SKETCH OF SEGMENT

As the segment is being canvassed, a rough sketch of the segment should be drawn on the segment sheets, and the dwelling unit located

<sup>10</sup>Statistical Abstracts of the United States. p. 70. 1944-45.

When the eligible respondent is not at home, an identifying name and location should be listed on the noninterview sheet. There should be a separate sheet for each county. These people should be visited once again. If they are then found at home, the name should be checked in the right hand column, "interview obtained." If on the second visit, no interview is obtained, no further attempt need be made unless further instructions are received from headquarters, but the proper call number should be kept, and the dwelling unit should be shown on the sketch of the segment.

A progress report will be made once each week at the end of the week, and mailed on Saturday to Ames. The progress report shall include the number of interviews made during the week, the number of calls and noninterview information.

Date \_\_\_\_\_ Weather \_\_\_\_\_ Time of day \_\_\_\_\_  
Present address: Place \_\_\_\_\_ State \_\_\_\_\_  
Segment number \_\_\_\_\_ Call number \_\_\_\_\_

1. Name \_\_\_\_\_ Sex \_\_\_\_\_
2. Place of birth \_\_\_\_\_ (State) \_\_\_\_\_ Country \_\_\_\_\_
3. Date of birth \_\_\_\_\_ Present height \_\_\_\_\_ Weight \_\_\_\_\_
4. Your order of birth: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 \_\_\_\_\_
5. How many brothers \_\_\_\_\_ Sisters \_\_\_\_\_
6. a. Marital status: Married \_\_\_\_\_ Single \_\_\_\_\_  
b. Were you living with your family or living single during the past year? \_\_\_\_\_
7. How many living children do you have? \_\_\_\_\_
8. How many years of your life were spent living in—
  - (a) Open country (i.e., outside a town or city)\* \_\_\_\_\_ Order \_\_\_\_\_ Years \_\_\_\_\_
  - (b) Place having less than 2,500 people \_\_\_\_\_
  - (c) Place having more than 2,500 people but less than 10,000 \_\_\_\_\_
  - (d) Place having 10,000 or more people \_\_\_\_\_
9. What is your business or occupation? \_\_\_\_\_
10. What is the general nature of your duties? \_\_\_\_\_

\*Parenthetical remarks are directed to the interviewers.

11. What is the national or racial background of your parents?  
     Mother \_\_\_\_\_ Father \_\_\_\_\_
12. Has this national background affected your food habits and preferences during the past year? Yes \_\_\_\_\_ No \_\_\_\_\_ Don't know \_\_\_\_\_
13. (If answer to Question 12 is yes, ask):  
     Has this influence been felt  
     (a) on holidays and special occasions \_\_\_\_\_  
     (b) in your day-to-day eating \_\_\_\_\_  
     (c) in other ways (specify) \_\_\_\_\_

#### B. QUESTIONS ABOUT FAMILY AND HOME OF RESPONDENT

1. What is the business or occupation of the head of the family?  
     \_\_\_\_\_  
     (Question 2 is for those not answering "farm operator" to Question 1)
2. Do you own your home? Yes \_\_\_\_\_ No \_\_\_\_\_ If yes, what is your equity in it? \_\_\_\_\_  
     (Question 3 is for those answering "farm operator" to Question 1)
3. How many acres are in the farm you operate? \_\_\_\_\_  
     How many of these acres do you own? \_\_\_\_\_ Value \_\_\_\_\_  
     How many do you rent from some one else? \_\_\_\_\_
4. Do you have running water piped into your house? \_\_\_\_\_
5. Is your house connected to an electric power distribution line? \_\_\_\_\_
6. Which of the following property does your family have?  
     Piano \_\_\_\_\_ Car \_\_\_\_\_ Radio \_\_\_\_\_ Electric or gas refrigerator \_\_\_\_\_
7. Did your family have any of the following for its use during the past year? Garden \_\_\_\_\_ Milk cow \_\_\_\_\_ Hens \_\_\_\_\_  
     Fruit trees \_\_\_\_\_ Pig \_\_\_\_\_ Veal calf \_\_\_\_\_ Beef \_\_\_\_\_  
     Sheep or goat \_\_\_\_\_
8. Did your family preserve or can food during the past year? \_\_\_\_\_
9. Which of the following types of refrigeration did your family use during the past year?  
     1. Ice box \_\_\_\_\_ 2. Electric refrigerator \_\_\_\_\_  
     3. Gas refrigerator \_\_\_\_\_ 4. Running cold water \_\_\_\_\_  
     5. Well (foods dropped for cooling) \_\_\_\_\_ 6. Home freezer \_\_\_\_\_  
     7. Commercial locker \_\_\_\_\_ 8. Carbon dioxide (dry ice) \_\_\_\_\_  
     9. Cellar \_\_\_\_\_ 10. Pantry \_\_\_\_\_  
     11. Window cooler \_\_\_\_\_ 12. None \_\_\_\_\_
10. What types of food storage did your family use during the past year? \_\_\_\_\_

#### C. MEDICAL HISTORY

1. Do you have, or have you had during the past year, any physical condition which affected (or is affected by) your food habits or preferences? Yes \_\_\_\_\_; No \_\_\_\_\_. If yes, can you name (describe) these conditions? \_\_\_\_\_
2. Here is a detailed list of conditions which may affect or be affected by food habits and preferences. Will you please check those conditions that you have or have had, together with any comments you wish to make?  
     (Use check list on schedule of Quartermaster Corps.)

#### D. MENU

1. How many people regularly ate their meals at your house during the past year? \_\_\_\_\_ During your childhood? \_\_\_\_\_

2. In your family, whose food preferences have the greatest influence on
  - (a) the selection of foods for the family \_\_\_\_\_
  - (b) the manner of preparation of foods \_\_\_\_\_
3. What are the most important factors which limit or restrict the selection of food for your family? \_\_\_\_\_  
 \_\_\_\_\_
4. How many people ate the following meals at your house yesterday?
  - (a) Breakfast \_\_\_\_\_
  - (b) Noon meal \_\_\_\_\_
  - (c) Evening meal \_\_\_\_\_
5. Will you give me the menu of your last meal and the menu for each of yesterday's meals? (In recording foods included in menu, be sure (1) to list number of glasses of milk, slices of bread, and servings of other foods; (2) indicate type of bread, as whole wheat, white, rye, biscuits, muffins, cornbread; (3) manner of preparation, as mashed, baked, or scalloped potatoes; buttered or creamed beans, the type and preparation of meat. (4) *Comment*—include here any unusual circumstances pertaining to the meal, as whether it was a "company meal," etc. Regarding the unusual recipe, do not record unless it is very unusual.)
6. We know that family income is a limiting factor in the selection of foods. Would you indicate into which of the following groups your family income during the past year would fall?
 

Less than \$1,000 \_\_\_\_\_

\$1,000 to \$2,000 \_\_\_\_\_

\$2,000 to \$3,000 \_\_\_\_\_

\$3,000 to \$5,000 \_\_\_\_\_

\$5,000 and over \_\_\_\_\_

### FORM FOR OBTAINING INFORMATION ON MENUS

#### RECORD OF MEAL IMMEDIATELY PRECEDING INTERVIEW

Approximate amounts  
or number of servings

Time meal was eaten \_\_\_\_\_ Where eaten \_\_\_\_\_

|               | Record of previous day's menu |                        |                  |
|---------------|-------------------------------|------------------------|------------------|
|               | Breakfast                     | Lunch or dinner        | Dinner or supper |
| List of foods |                               |                        |                  |
| Time eaten    |                               |                        |                  |
| Where eaten   |                               |                        |                  |
| Comments      |                               |                        |                  |
| Snacks        | Foods                         | Approximate time eaten |                  |

Unusual recipe

Name:

Use back of page to record recipe (if necessary).

## SAMPLE PAGE FROM SCHEDULE A\*.

| Vegetables       | Serving size |        | Degree of preference or not tried | Servings                  |                      | Preparation, cooking and serving method                         |                                                       | Variety or kind |          | Physiological effect or tabu |                    |
|------------------|--------------|--------|-----------------------------------|---------------------------|----------------------|-----------------------------------------------------------------|-------------------------------------------------------|-----------------|----------|------------------------------|--------------------|
|                  | No.          | or wt. |                                   | Previously eaten per week | Desired no. per week | Most highly preferred form, time, temp., order, and combination | Most highly disliked form preparation, or combination | Preferred       | Disliked | Favorable effect             | Unfavorable effect |
| Artichokes       |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Asparagus        |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Beans in pod     |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Beans, shelled   |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Beet, tops       |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Beet, roots      |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Broccoli         |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Brussels sprouts |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Cabbage          |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Carrots          |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Cauliflower      |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Celery           |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Chard leaves     |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Chinese cabbage  |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Chives           |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Collards         |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Corn, field      |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Corn, sweet      |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Cucumbers        |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Dandelion greens |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Eggplant         |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |
| Etc.             |              |        |                                   |                           |                      |                                                                 |                                                       |                 |          |                              |                    |

\*Information about a detailed list of food items such as those given on the sample page was requested from one-fourth of the respondents. All respondents were asked about the list of foods and food groups given in table 14, p. 923.

INSTRUCTIONS<sup>11</sup> TO INTERVIEWERS

## I. GENERAL

These instructions are supplemental to those contained in the 31 page manual<sup>12</sup> of instructions which you already have. They are necessary because the questionnaire which you are to use is being revised in two places—(1) check list of personal information and (2) previous day's menu.

The information wanted under the headings "date," "weather," "time of day," "present address," "segment number," and "call number" can be filled in by the interviewer before beginning the interview. In most cases, the name and sex are also known (from pre-list information).

## II. INSTRUCTIONS ABOUT SPECIFIC QUESTIONS

## PART A

*Question 1-7, inc.*, need no additional instructions. However, care should be taken so that each question is answered. No question should be left blank. If a person doesn't know the answer, write in "don't know." If they don't want to divulge the information, write in "refused." If the question requires a "yes" or "no" answer, be sure to write in either "yes" or "no." Do not merely check the place left for the answer.

*Question 8.* This question is designed to obtain the information necessary to classify the respondent as "city-bred" or "country-bred." "Order" refers to the sequence of the periods during which the respondent lived in the different zones. For a 48-year-old person living the first 10 years of his life in a place having less than 2,500 people, the second period (13 years) in a city of over 10,000 people, the third period (say 6 years) in a place having between 2,500 and 10,000 people, then a fourth period (19 years) in a place having less than 2,500 people, question 8 would be answered as follows:

|                                                                     | Order | Years | Order | Years |
|---------------------------------------------------------------------|-------|-------|-------|-------|
| a) Open country (outside a town or city).....                       | 1     | 10    | 4     | 19    |
| b) Place having less than 2,500 people .....                        |       |       |       |       |
| c) Place having more than 2,500 people but<br>less than 10,000..... | 3     | 6     |       |       |
| d) Place having 10,000 or more people.....                          | 2     | 13    |       |       |

The respondent may not remember the exact number of years spent in the different places. He should be able to remember approximately, however, and the total number of years should approximate the respondent's age. If the respondent doesn't know the size of the place, write in the place and county name.

*Questions 9 and 10.* One purpose of these questions is to group the respondents into those having active occupations and those having sedentary occupations. Sometimes the answer to question 9 gives this information, i.e. teacher, doctor, brick-layer. Many times however, additional information is necessary. Question 10 should be answered briefly, using one word when possible (i.e., clerk, mechanic, lathe-operator, ditch-digger).

*Questions 11, 12, 13.* These questions are asked to find out if the respondent is aware of any effect the national background of his parents may have on his food habits and food preferences; and if he is aware of some effect, whether it occurs frequently (i.e., in day-to-

<sup>11</sup>These instructions were prepared to cover the portions of the questionnaire which were additions by the Foods and Nutrition Department to the QM schedule.

<sup>12</sup>Prepared by Food and Container Institute of the Quartermaster Corps.

day eating habits) or infrequently on holidays and special occasions. In part c, question 13, be sure to *list* the other ways. It may be possible for a respondent to answer "yes" to parts a and b and still list some other way in part c of question 13.

## PART B

*Question 1.* If the respondent is the head of a family, question 1 will be a duplication of question 9, part A; otherwise, it will be new information.

*Question 2.* If the respondent is not a farmer or "farm operator," ask this question. Equity value means the amount of money paid toward the purchase price of the home.

*Question 3.* This question should be substituted for question 2 when the head of the family is a farmer or farm operator. By "farm" is meant what the respondent thinks of as a farm.

*Questions 4 and 5.* The answer to these questions is quite often self-evident, especially in towns and cities.

*Questions 6, 7, 8, 9 and 10.* These questions need no additional instructions. Make sure that each is answered, i.e., if family does not have any of the items write "no" or "none."

## PART C

Questions 1 and 2 are designed to get quite similar information. The difference is in the way the question is asked. In question 1, just ask the question as it appears. Then ask question 2 and give the list of conditions to the respondent so he can check the conditions that apply to him. Do *not* make any changes in the answers to question 1 after the respondent has seen the list of conditions for question 2.

## PART D

*Question 1.* This should include members of the family and anyone else regularly eating their meals at this house. By childhood we mean 14 years of age and under.

*Question 2.* We are trying to find out whether it is the father's or mother's or the son's or daughter's preferences which are most important.

*Question 3.* Some of the limiting factors are cost, availability in market, time necessary for preparation, accessibility to market, caloric value, allergies, family dislikes and religious reasons.

*Questions 4 and 5.* Use the special menu sheet for recording menus.

*Question 6.* If the respondent doesn't wish to give this information, write "refused" as the answer. Do not ask this question until all information, including menus, has been received.

## APPENDIX C. SAMPLE LIST OF FOODS AS CONSIDERED IN CODING EACH GROUP IN MENU PATTERN ANALYSIS

### *Appetizers*

Soups  
Fruit juices  
Vegetable juices

### *Salads*

Fruit salads  
Vegetable salads\*  
Lettuce salad\*

### *Citrus Fruits, Tomatoes and Raw Cabbage*

Grapefruit  
Lemons  
Melons, garden  
Melons, water  
Oranges  
Tomatoes  
Raw cabbage

---

\*If specified as salad, otherwise considered as a vegetable.



*Green and Yellow Vegetables Breads (Continued)*

Artichokes  
Asparagus  
Beans in pod  
Broccoli  
Brussel sprouts  
Carrots  
Corn, field  
Corn, sweet  
Peas in pod  
Peppers  
Sweet potatoes  
Okra  
Pumpkin  
Rutabaga  
Squash  
Succotash  
Yams

*Desserts (Including fruit if specified as dessert)*

Fruits\*\*  
Fruit bars  
Fruit cakes  
Cakes  
Cookies  
Pies  
Other pastry  
Puddings  
Gelatin  
Ice cream  
Junket  
Sherbet

*Hot Breads\*\**

Griddle cakes  
Waffles  
Biscuits

*Breads*

Biscuits  
Doughnuts  
Dumplings  
Muffins  
Popovers  
Rolls  
Sandwiches  
Waffles  
Cornbread  
Oat bread  
Potato bread  
Rye bread  
Soybean bread  
Whole wheat bread  
White bread

Crackers  
Rye krisp  
Brown bread  
Raisin bread

*Green Leafy Vegetables*

Beet tops  
Chard leaves  
Chives  
Collards  
Dandelion greens  
Endive  
Chicory (escarole)  
Kale  
Lettuce  
Mustard greens  
Parsley  
Spinach  
Turnip greens  
Water cress

*Accessories*

Honey  
Whipped cream  
Applesauce  
Cranberries  
Jelly  
Sauces—Barbecue  
Catsup  
Chili sauce  
Cocktail sauce  
Horse-radish  
Mustard  
Soy sauce  
Tartar sauce  
Tabasco sauce  
Worcestershire sauce

Gravies  
Relishes  
Olives  
Pickles  
Spiced fruit  
Spreads for bread  
Fruit spreads  
Margarine  
Meat spreads  
Syrups  
French dressing  
Mayonnaise  
Salad dressing  
Salad oil  
Salt  
Sugar  
Vinegar

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\*\*Breakfast meal only.